T H E S I S

ENDOTHELIOMA OF THE OVARY

with Notes on two Cases

Compiled by

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30th April 1908

Acknowledgment:

I must express my very grateful thanks and deep appreciation to Mr Brewis for his kindness in allowing me to make use of the material for these cases collected from his wards in the Royal Infirmary, Edinburgh; and also to Mr Hodsdon for his kind permission to publish the surgical portion of my first case - operated on by him in Ward 5. A. Royal Infirmary, Edinburgh.

C A S E I.

N A M E: Bella McK

A G E: 20 years, Single

OCCUPATION: Oat Cake Baker

ADDRESS: 181 Gorgie Road, Edinburgh

BIRTHPLACE: Glasgow

ADMITTED: 14th September 1906
Ward 36.

COMPLAINT: Swelling in lower abdomen and pain when she turns herself.

DURATION: Two months.

H I S T O R Y

PRESENT ATTACK: Two months ago when patient was "unwell" and suffering pain as she always did at these times, she placed her hand over her lower

abdomen and noticed on the right side a small swelling about the size of a marble, and feeling about as hard as a marble would do. This swelling grew rapidly, and at the end of two weeks was nearly as large as a hen's egg and still very hard. About this time she noticed a similar swelling on the left side, but it was not so hard as the swelling on the right side, and she describes it as having a different feeling altogether.

At the end of two months the right tumour was as big as a large fist and very hard.

During these two months the patient suffered from a sharp "jagging" pain across the lower abdomen every time she moved - such as turning in bed, bending herself etc.

She menstruated regularly during these two months.

In January of this year patient attempted to lift 6 stone of meal, but whilst carrying it fell forward exhausted and had to leave her work and go home.

She remained at home for a week feeling very done up and very "sick" but never vomited. She had a severe headache and felt feverish. At the end of a week she had improved sufficiently to return to her work but has never felt quite right since. She always had a "done up" feeling at the end of the day, always had a feeling of "sickness" and often fainted. This she thinks was due to the heat in which she had to work.

She now began to suffer from more severe pain at her menstrual periods and this was across the lower abdomen. Hitherto the pain which she always had had during her periods,- ever since they

commenced,- had been confined to the back. This pain was worst on the first day, easier on second day, and often as bad as ever again on third day.

Patient is always "unwell" for about 7 days.

Patient left school when she was 13½ and went to the dress-making trade for 15 months, and during this time she enjoyed splendid health, and was not pale at all. Towards the end of this time she commenced menstruating.

From dress-making she went to biscuit packing, and here too was pretty well, with the exception of the pain at her periods. At this occupation she remained for 3 years.

At the end of this time she was transferred to the Oatcake Baking Department, and from this she dates her ill-health.

She was confined in a very hot room, tempera :ture in summer frequently 120° and in winter 84°; from this heat she used to come out directly into the open air.

She noticed herself becoming very pale at this occupation and she began to suffer from fainting fits, and always had a "done up" feeling at the end of the day; she also became very breathless and subject to headaches, and has been getting thinner and weaker during the past year.

Apart from this patient has always had good health; has never had any serious illnesses; was treated for "bloodlessness" last year.

SOCIAL CONDITIONS & HABITS:

Large comfortable home with plenty of good food.

FAMILY HISTORY:

Mother and Father alive and well

1 Brother and 2 sisters alive and well

1 Sister, aet. 11, suffers from Epileptic Fits.

1 Sister, aet. 7 months, died of Convulsions.

GENERAL CONDITION:

Patient is a thin girl, extremely pale and excessively freckled. There are no deformities but muscularity is very poor.

SEXUAL HISTORY:

MENSTRUATION

A. Normal:

Started at 15 years

Type: 28 day

Duration: 7 day

Quantity: Heavy

B. Morbid:

Amenorrhoea: None

Menorrhagia: Present

Dysmenorrhoea: As in History

Intermenstrual Discharge: None

MICTURITION:

Normal. No frequency and no pain.

DEFAECATION:

Bowels as a rule are constipated, but during past two weeks has taken medicine which has acted perfectly

RESPIRATORY SYSTEM:

No subjective symptoms.

Inspection: The chest is fairly well formed, but walls are very thin, ribs and clavicles standing out prominently.

Palpation: Vocal Frematus normal, chest expands equally on both sides.

Percussion: No impairment of normal percussion note anywhere over the chest.

Auscultation: The breath sounds are normal vesicular without any morbid accompaniments.

CIRCULATORY SYSTEM:

Subjective symptoms. Some Dyspnoea on exertion.

Pulse: 72. Slightly irregular, volume fair, systolic pressure fair, Dyastolic pressure low.

Inspection: Apex beat situated in 5th interspace, about 3¼ inches from mid-line. No abnormal pulsations.

Palpation: Confirms position of apex beat; no thrills can be felt.

Percussion: The heart is not enlarged.

Auscultation:

Mitral area: First sound is not quite clear, second sound closed.

Aortic: First sound weak, pulmonary 2nd sound accentuated. Tricuspid sounds closed.

DIGESTIVE SYSTEM:

Takes food well. No abnormal disturbances such as pain or vomiting after food.

Urinary System:)
)
Nervous System:) Nothing abnormal to note

ABDOMEN:

Inspection: On inspection a rounded projection is seem to the right and slightly below the umbelicus, and a fullness below the umbelicus extending into the left groin, with distended veins in left Illiac region.

Palpation: Hard masses are to be made out to the right and below the umbelicus, and also extending into the left lumbar region. There is considerable tenderness in the mid-line, midway between umbelicus and pubis.

Percussion: There is a slight suspicion of free fluid in abdominal cavity.

VAGINAL EXAMINATION:

Orifice: admits two fingers with slight difficulty.

Walls: smooth and moist

Cervix: High placed, small and somewhat conical.

Fornices: Through both lateral and posterior Fornices a hard solid mass can be felt which is slightly moveable.

Bi-Manually: The uterus appears to be lying to the front and small.

HAEMOPOETIC SYSTEM: Hb.° 45%

R.B.C. 3,900,000

W.B.C. 13,500

Diagnosis : Ovarian Tumours

Prognosis : Unfavourable

Treatment : Operative.

OPERATION:

The Abdomen was opened in mid-line and the hard masses in the pelvis were found to be double ovarian tumours.

There was a small quantity of free fluid in the abdomen, 1-2 oz. in pelvis.

The Left Ovary: Was the smaller and was first dealt with. It had a well marked pedicle.

Then the Right Ovary was removed, its tumour being a little larger. The pedicle was easily legated and divided. The stumps of the pedicles

were then dressed. On the left side sufficient of the tube had been saved to cover up the raw surface. On the right side the stump was rolled round till its raw surface faced the posterior aspect of the Broad Ligament, here it was fixed by a catgut stitch that was fixed in the pedicle and passed through the Broad Ligament and ligatured on its anterior aspect.

The abdominal wound was closed in the usual way. Each separate layer of the abdominal wall being sutured together and all the sutures being buried.

PROGRESS OF CASE:

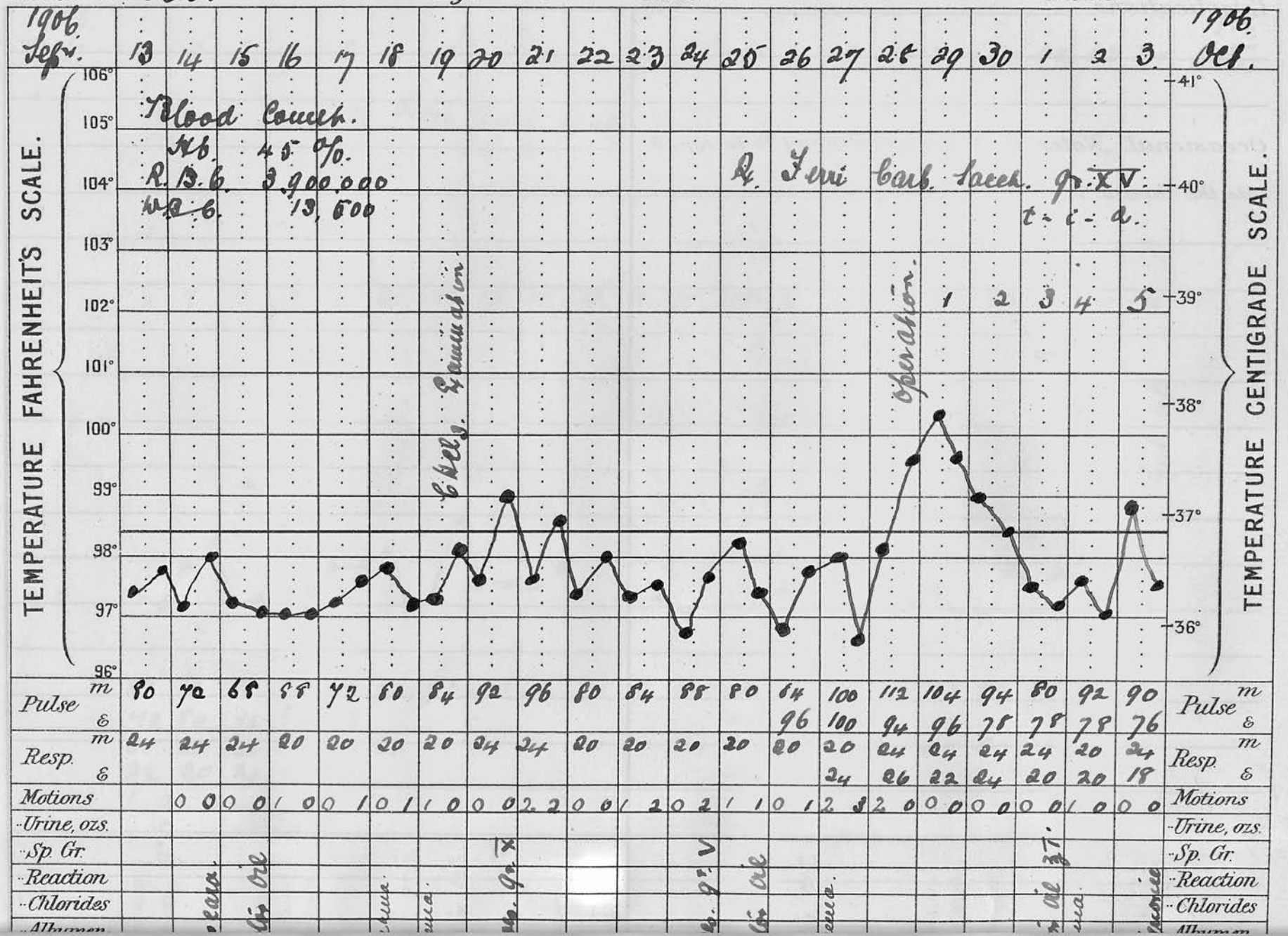
The patient made an uninterrupted recovery from the operation and was discharged on the 32nd day feeling well.

FURTHER NOTES:

She was re-admitted to Medical Ward 27 exactly one year later suffering from severe pain in

her back and left side and persistent vomiting of less than three months' duration. She was kept under observation in Ward 27 for 4 days and then transferred to Ward 5.A. for surgical treatment.

Name Bella. M K. Age 20. Disease Result



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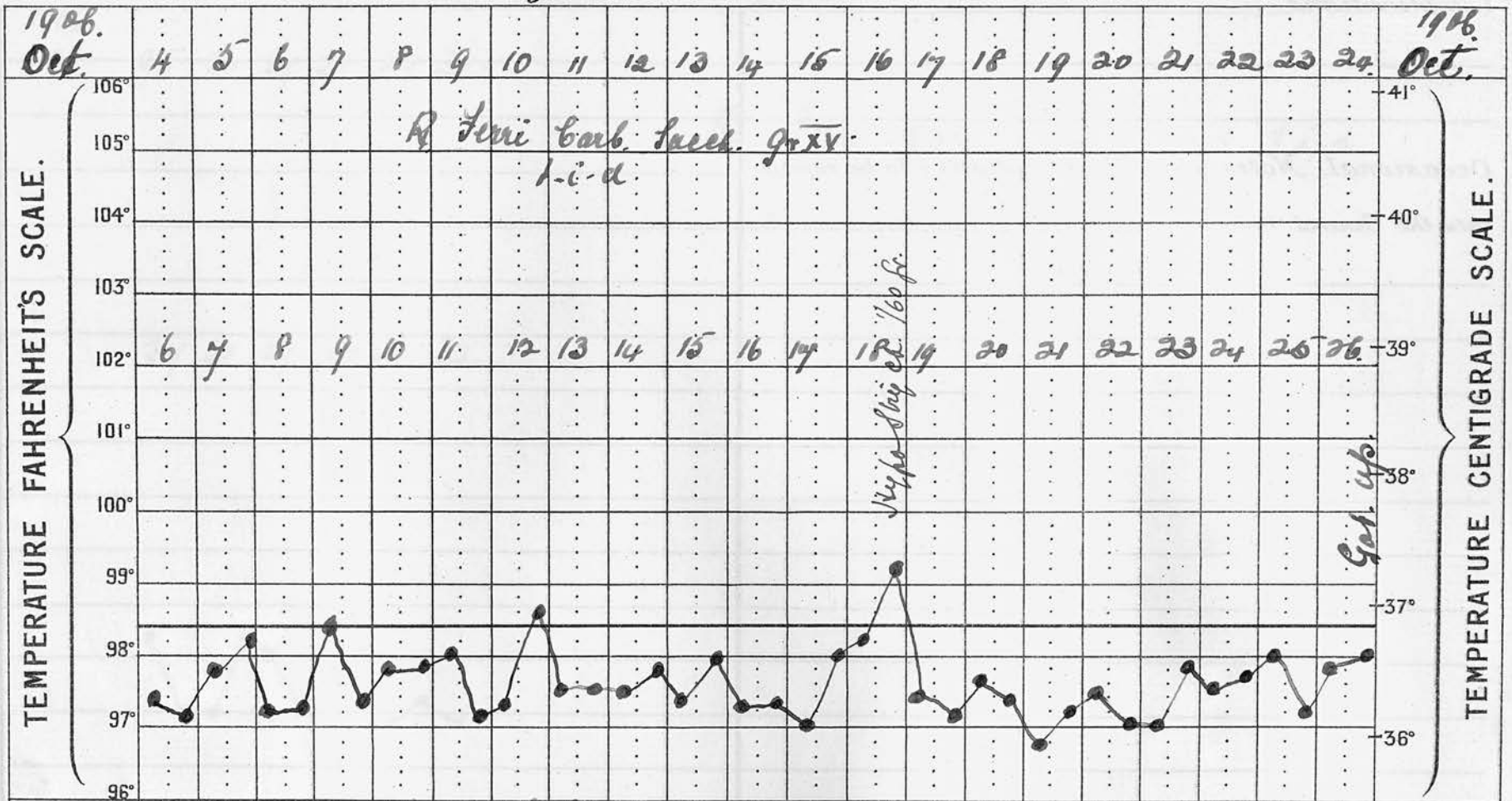
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TEMPERATURE FAHRENHEIT'S SCALE.
106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°
TEMPERATURE CENTIGRADE SCALE.
41° 40° 39° 38° 37° 36°
℞ Ferri Carb. Sacch. gr XV. t.i.d.
Night Sleep at 160 P.S.
Gen. Agg.
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 26 26
Pulse m 88 92 76 72 76 72 76 80 84 80 76 84 156 88 88 76 80 80 76 72 104
Pulse & 70 84 72 86 76 112
Resp. m 20 20 20 24 22 22 20 20 20 20 20 24 24 22 24 24 20 20 20 20 20
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Motions 1 0 1 0 0 0 1 0 0 1 0 0 1 2 3 0 1 0 1 0 1 0 1 0 1 0 0 2 0 0 0 1 0 1 1 0 0 1 0 1 0
Urine, ozs.
Sp. Gr.
Reaction
Chlorides
Albumen
Sp. Gr. IV
Sp. Gr. X
Sp. Gr. X
Sp. Gr. X
acid
acid
acid

Name Bella. McK. Age 20. Disease Result

1906 Oct.	25	26	27	28	29	30
TEMPERATURE FAHRENHEIT'S SCALE. 106°						
105°						
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Pulse m &	92	96	96	96	96	88.
Resp. m &	24	24	24	24	24	24
Motions	3	0	0	0	1	1	3	3	2	2	2
Urine, ozs.						
Sp. Gr.						
Reaction			Acid.		Acid.	
Chlorides						
Albumen						

Rx Ferri carb. sacch. gr. x. t. i. d.

41° 40° 39° 38° 37° 36° TEMPERATURE CENTIGRADE SCALE.

Pulse m & Resp. m & Motions Urine, ozs. Sp. Gr. Reaction Chlorides

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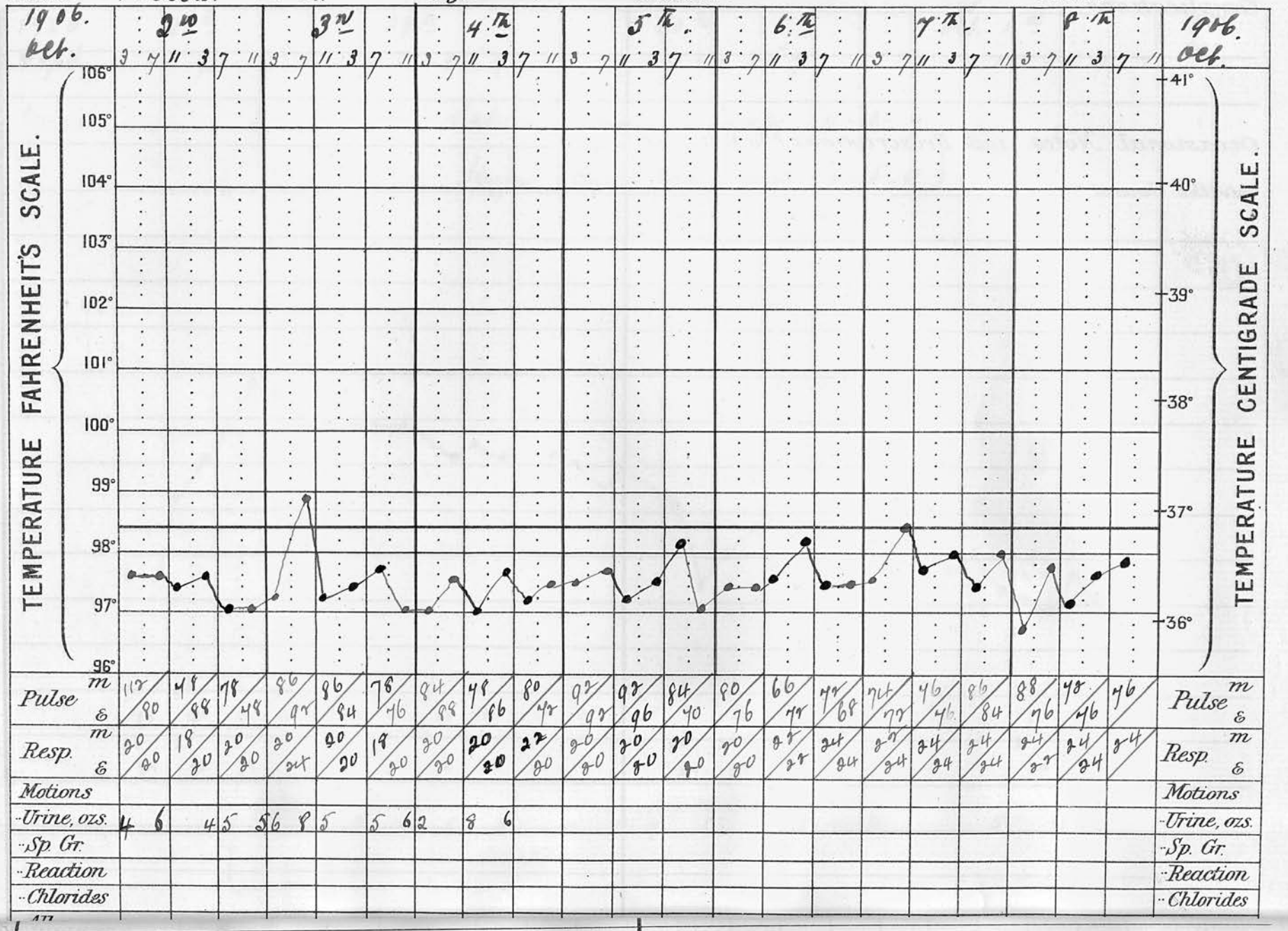

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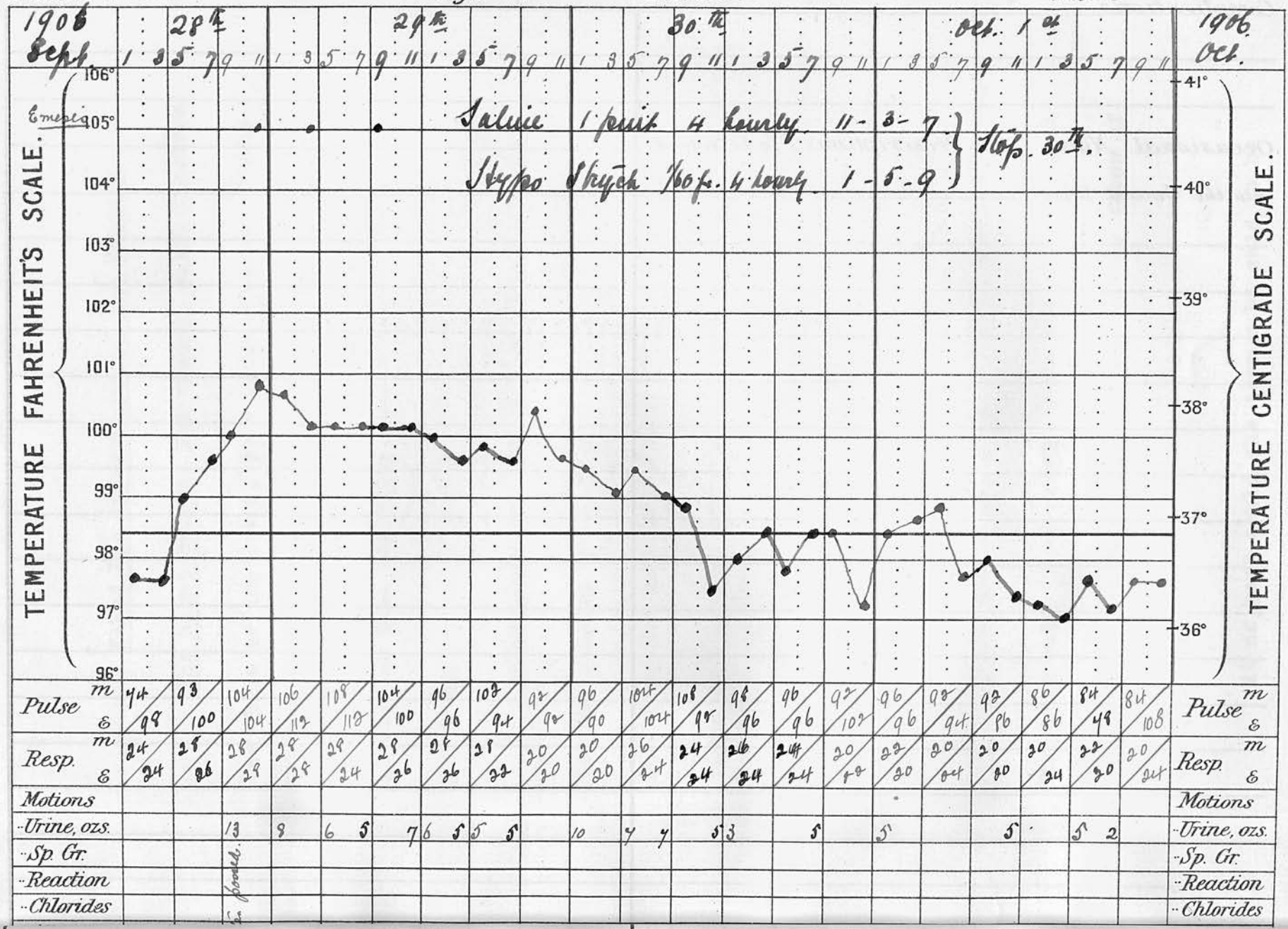


Naked Eye Appearances of the Tumours

The Right Ovary: The tumour, which involves the whole of the ovary, is a large somewhat nodular mass of an irregular ovoid shape, slightly broader at one end than the other, and measuring 37.5 x 22.5 x 7.5 cm.

It presents two ill-defined constrictions, the one running transversely and notching both borders and being not so well-defined on the flat surfaces. There is a marked constriction running in the long axis of the tumour, marking on the one side the attachment of the Broad Ligament.

The weight of this tumour is 1 lb. 14½ oz.

There are no areas of evident degeneration to be noted externally, though here and there beneath the capsule are patches which may well be those of early softening.

At no part could the tumour be said to be

friable, but is everywhere firm, and somewhat elastic to the touch - the impression given to the hand being that of squeezing a hard irregular mass of rubber.

Surface: Is somewhat irregular and nodular, this being more marked at the edges than on the flat surfaces, and especially well marked on the concave border. There are on either surface two large nodular masses which extend round on to the concave border.

There are likewise several smaller nodules bulging the capsule and scattered irregularly over all the surfaces. These smaller nodules are most marked towards the poles of the tumour.

Colour: The general colour is a dull yellowish grey, and the tumour presents a waxy appearance. In parts where the capsule is thicker the colour is more definitely grey. Here and there are reddish streaks marking the lines of blood vessels,

while over some of the larger nodules are dark reddish patches, evidently caused by subcapsular haemorrhages.

On Section: The Capsule is for the most part a comparatively thin fibrous membrane, thin over the nodular areas and thicker over the flat non-raised areas, where it presents a whitish grey appearance.

Capsule: The Capsule is adherent to the tumour, though at several parts it can be detached, and from it can be seen fibrous tissue trabeculae passing into the tumour in all directions and dividing the tumour tissue into loculi. This is well shewn in the accompanying photographs.

There are two longitudinal fibrous bands part of which shew some myxomatous change, and from the larger of these bands some thinner bands run towards the capsule.

Consistency: The general consistency of the tumour is firm and elastic, though scattered

throughout it there are small areas of softening which present a yellowish appearance. These areas lie between bands of somewhat degenerated fibrous tissue.

About the centre of the tumour and rather nearer its broader end is a large rounded area about 1½ inches in diameter, which is of a more spongy consistence and of a yellowish colour. In this area can be seen the remains of fibrous bands, the whole presenting the appearance of necrotic tissue. This area is surrounded by a fibrous tissue capsule, from which irregular bands pass out into the tumour tissue proper.

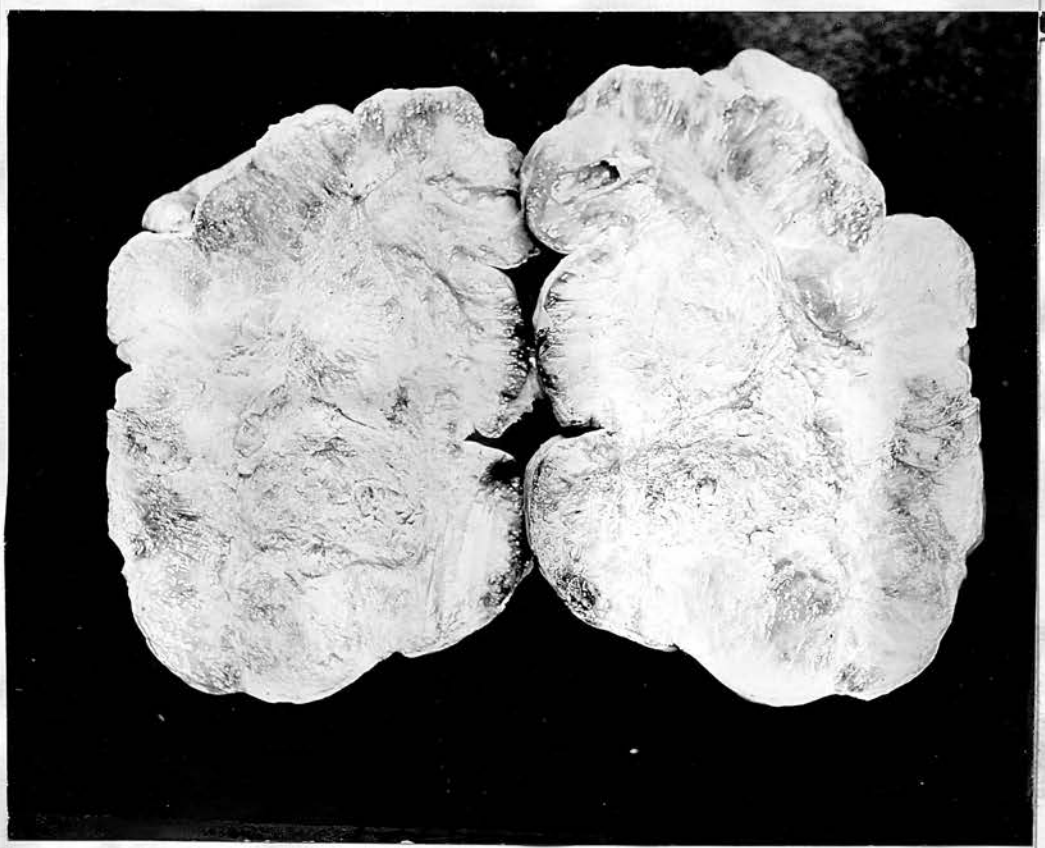
To one side of this area is a small rounded area of colloid degeneration, presenting the typical appearance of boiled sago.

Beneath the capsule the tumour tissue shews a slight admixture of muscular tissue, though this

RIGHT OVARY

Surface View

Sectional View



does not extend inwards for more than ½ an inch.

Also beneath the capsule are several areas in which some haemorrhage has taken place previously, but there are no recent haemorrhages present in the section.

LEFT OVARY: This tumour is somewhat smaller than that of the right side, measuring 32.5 x 10 x 5 cm. and weighing 1 lb. 2 oz.; it is much thinner and does not present the same nodular appearance. It has however two large nodules on its convex border, over which the capsule is stretched, and on its flat surface there are a few very small nodules.

Shape: Its shape is an irregular ovoid, though the broad ligament is attached on the edge and not as in the right ovary on the flat surface; so that the tumour is flattened, as it were, from above downwards.

The Capsule: Appears on the whole thicker than in the right, but there is only very slight evidence of haemorrhage.

A few vessels can be seen beneath the capsule.

Colour: The colour is much the same as in the right, though there is not so pronounced a yellow tinge.

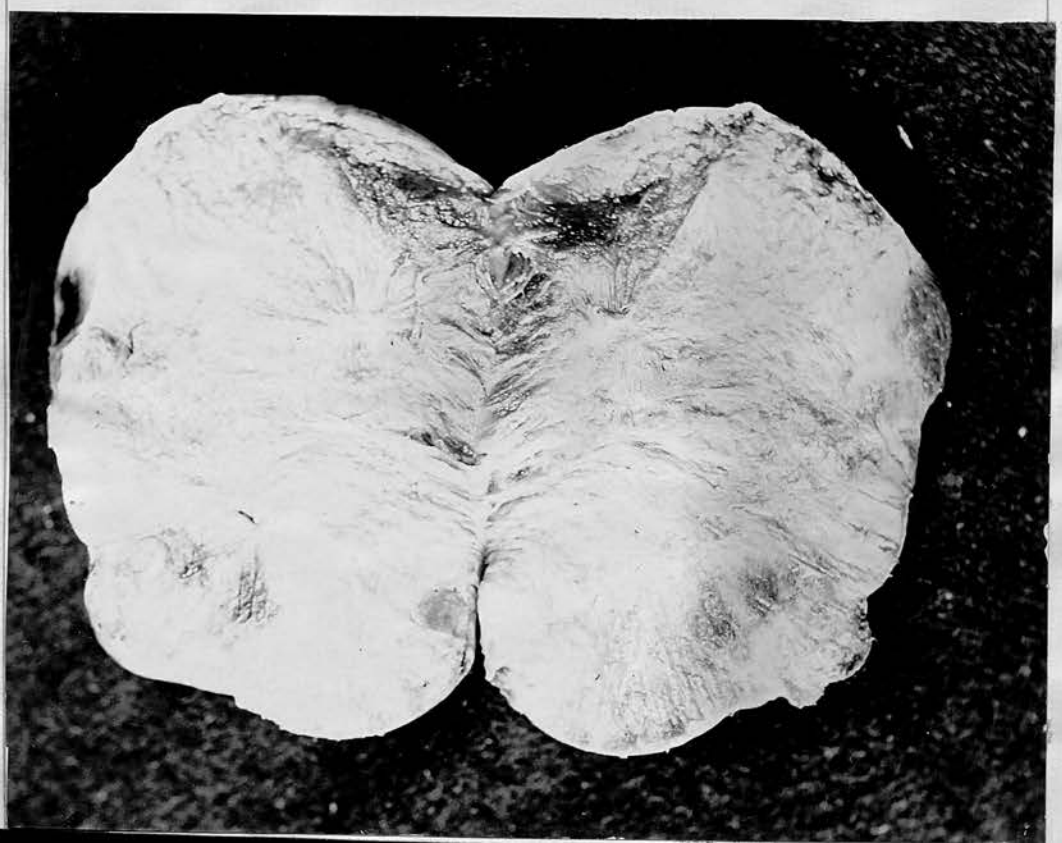
To the feel this tumour is not so elastic as that of the right. There are no soft areas except at the one pole where there is a large area of softening which gives almost the impression of fluctuation.

On Section: The Capsule is thicker and more adherent than in the right and from it there are several fine fibrous bands passing into the interior of the tumour.

LEFT OVARY

Surface View

Sectional View



Towards the centre the fibrous tissue becomes more apparent, and throughout shews more distinct myxomatous change.

Beneath the capsule and also near one pole there are areas of early necrotic change.

In parts the appearance given is that of a fine cirrhosis, the small islets of tumour tissue being surrounded by degenerated fibrous tissue.

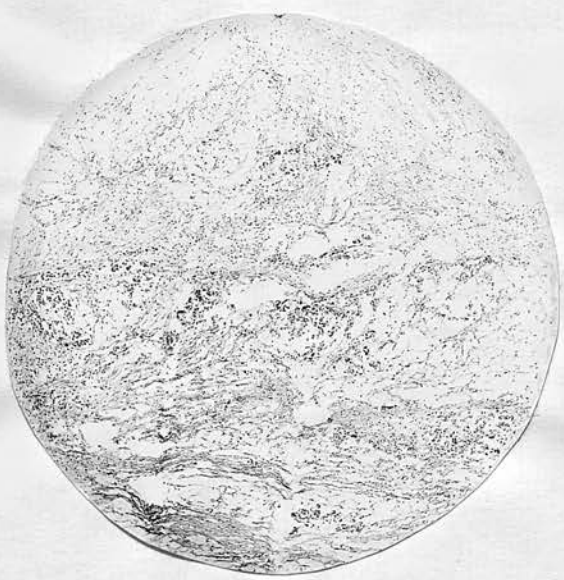
Towards the smaller pole there are several small areas of colloid change, while the greater part of the opposite pole is undergoing a myxomatous change where it looks and feels like mucous tissue.

The muscular tissue is much less evident, there are also a few scattered petechial haemorrhages.

MICROSCOPIC EXAMINATION

The low power Microphotograph (x 120) shews the stroma of the ovary to be extensively infiltrated with new growth, which has undergone considerable

change, of the nature of that described as colloid. Here and there are spaces containing small masses of cells, but the nature of these cannot be distinguished under the low power. This section is through an older portion of the growth than is the section taken from my Case II., so that the growing edge shewing the Endothelium in a state of proliferation is not so well or easily seen. It was therefore with considerable difficulty that I was able to arrive at a definite conclusion, but the appearance shewn in the high power microphotographs, taken with other facts in the case is, I think, sufficiently conclusive.



Low Power (x 125)

High Power Microphotograph:

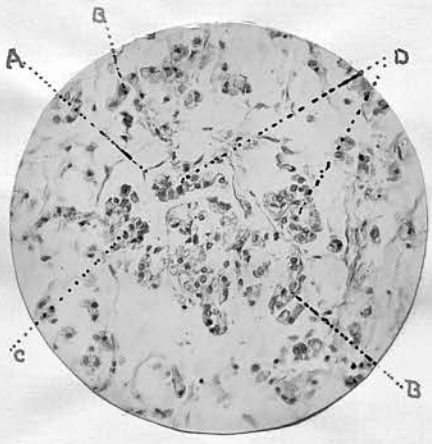
In parts of this section the Endothelial cells are seen to be in masses, and to shew varying degrees of colloid change. In many the cell protoplasm has disappeared, and a clear space is left, representing the colloid material, while the nucleus is pushed to one side and flattened against the cell membrane.

In other cells the protoplasm is granular and the nucleus round, the change not having gone so far.

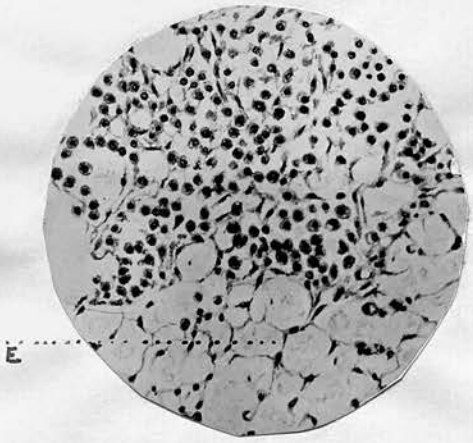
It is where the colloid change is most marked that spaces are left filled with granular debris and cell remains. These spaces look somewhat like a fibrillar stroma, but at some parts the endothelial cells lining the spaces can be distinctly seen, indicating that they are lymphatics, the endothelial cells of which have degenerated.

Some sections shew definite bands of fibrous tissue traversing them, while others are more cellular, but everywhere the colloid change is a prominent feature.

The stroma in the more cellular parts of the tumour is very delicate and somewhat resembles the lymphatic spaces, though it does not shew the flattened endothelial lining of the latter, and is more fibrillar.



Right Ovary (x 300)



Left Ovary (x 300)

A. Spaces shewing normal endothelium lining lymph space.

B. Endothelium just beginning to proliferate.

C. The endothelial cells shew considerable proliferation and form a group-like mass, still attached to part of the wall of the space.

D. Note alveolar arrangement formed by the proliferated cells.

E. Spaces shewing colloid change.

In this photograph the colloid change is well shewn, some of the spaces being almost empty, in others a little debris and cell remains persists.

The nuclei of the cells have stained well in this part of the section, and only a few of the cells in the alveolar arrangement shew any colloid change.

The cells noted in the various sections examined are large, rounded or ovoid, shewing a distinct cell membrane and somewhat abundant cytoplasm, which takes on the eosin stain well. The nucleus is rounded and in most cases eccentric. It does not stain deeply with Haematoxlin and shews delicate cromatin threads.

A Nucleolus can be seen in only a few of the cells.

I am therefore of opinion that one is justified in considering this tumour an endothelioma arising from the endothelium of the lymphatics - an opinion also held by Mr Muir of the Pathological Department of the University of Edinburgh, who primarily reported on the condition.

The microscopic appearances of both tumours are practically identical.

In making a critical survey of this case, there are certain points of interest which must strike one.

The first noticeable point in this case is the early age at which the symptoms developed. As we are undoubtedly dealing here with a malignant condition, one would be inclined to consider the possibilities of its being of a sarcomatous or endotheliomatous origin in preference to carcinoma, on the grounds of the youth of the patient. (Yet

within a year we find her to be suffering from true carcinoma).

This however can by no means be said to exclude carcinoma as there are numerous cases on record where this disease has developed at a much earlier age than in this particular case. Osler & McCrae in their book on "Cancer of the Stomach" have gone freely into the age incidence of this disease and have collected from all sources 10 cases under the age of 10, and 13 cases between the ages of 10 and 20, where the stomach has proved to be the seat of carcinoma.

Another interesting point is the entire absence of any hereditary taint, as far as one can judge of the family history, and this is to be expected if one accepts the statement of Barrett, that heredity does not appear to have any considerable bearing on the aetiology of the endotheliomata.

Another interesting point in this particular case is the very rapid onset of the disease. The swelling first noticed on the right side increased in size from that of a marble to that of a hen's egg in two weeks, and in two months was as large as a man's fist; while in 10 weeks it had increased to, roughly speaking, the size of a child's head, measuring 37.5 x 22.5 x 7.5 cm. and weighing 30½ oz.

The left tumour, from the time it was first noticed, i.e., at a period two weeks later than that of the right side, had also increased at a phenomenal rate, though it does not quite reach the dimensions of its fellow tumour, measuring at the time of the operation 23.5 x 10 x 5 cm. and weighing 18 ox.

Hewlett states this to be a slow growing condition, but this is not borne out in this particular case.

The thinness of the patient is probably to be accounted for by the fact that she was suffering from a malignant disease.

A very important point in this case, in point of view of the subsequent history, is, that when she was first seen and operated upon, her digestive system was apparently quite normal, she being able to take and digest her food well, and suffered from no pain or inconvenience relating to the stomach.

The menstrual functions appear to have been very little disturbed, there being only a slight leucorrhoea; the dysmenorrhoea from which she suffered having been present from the commencement of her menstrual life.

The low percentage of haemoglobin and the somewhat reduced number of R.B.C's points to the presence of a rather pronounced anaemia, probably due to her unhealthy surroundings while at work,

and possibly aided by the fact that she was suffering from a malignant disease.

SURGICAL CASE

WARD 5. A.

NAME: Bella McK
181 Gorgie Road,
Edinburgh.

AGE: 21 years,- Single

OCCUPATION: Oatcake Baker

ADMITTED: 6th November 1907

OPERATED ON: 6th November 1907

COMPLAINT: Pain in left side and back, with persistent vomiting.

FAMILY HISTORY: Father and Mother alive and well. One sister died of convulsions. Rest of family all strong and well.

SOCIAL CONDITIONS: Satisfactory.

HISTORY

Operated on a year ago in Ward 36, when both Ovaries were removed for Endothelioma.

In July patient suffered from a nagging pain in her stomach, constant and more severe about 1 hour after food.

She frequently vomited, but the character of the vomited matters was not particularly noticed.

Under medical treatment she improved for about a month and then the pain seemed to situate itself in the bowels.

She suffered from obstinate constipation, and after taking medicine to relieve this condition she always suffered from severe pain in left side.

In October she began to suffer from a severe pain in the back, at the level of the 12th rib, and more marked on the left side. This pain was usually worse at night. Since then the pain has been very severe, and for three weeks previous to admission she states that she has had morphia regularly.

INSPECTION:

Signs are all masked by Opium. The patient still complains of marked pain in left side in region of 12th rib, and also in the back. The abdomen is slightly rigid.

No patterns are to be seen; the right side of the abdomen seems to be a little enlarged.

On palpation no tumour was to be felt, but slight pressure on the abdominal walls was at once resisted. The patient had a History of Melaena and coffee ground vomiting while in Ward 27. Patient has also complained of a shooting pain in the left side of the abdomen in the region of the uriter, which at the time of examination was not present.

Urine: Sp. Gr. 1016
React. Acid
Deposit Mucous and Phosphates

Albumen and blood both present. No bile or sugar present.

Nothing to note in other systems.

OPERATION

6th November 1907: Mr Hodsdon.

Anaesthetic: Ether and Chloroform.

An incision was made 5 inches in length from edge of ribs, slightly to right of middle line into the abdominal cavity.

A large hard mass was at once felt in the region of the pylorus, extending to anterior wall of the stomach; to gastro hypatic omentum, and to the vertebrae behind. There were a few adhesions between the stomach and liver. The Foramen of Winslow was patent.

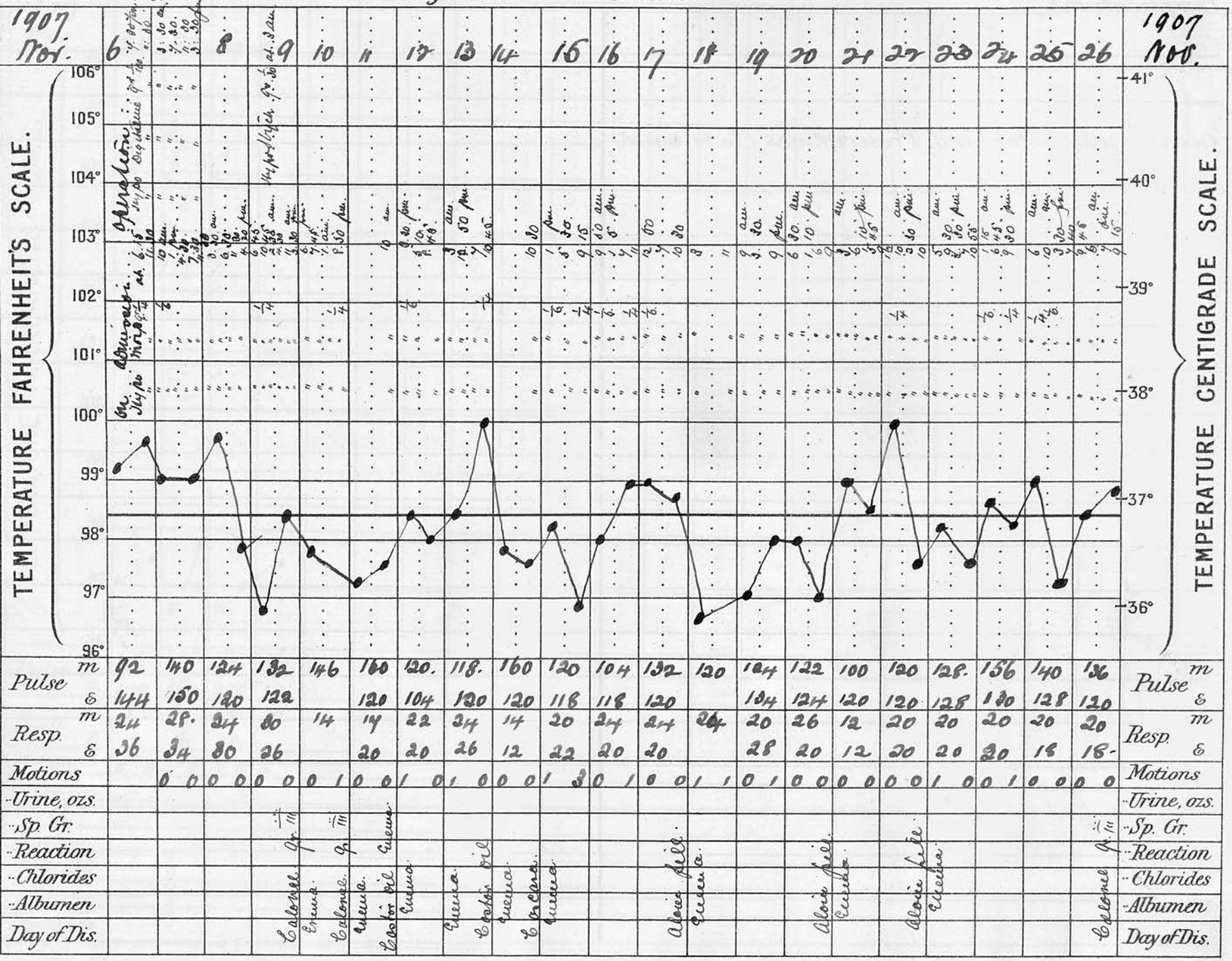
As it was found to be impossible to remove the disease, and as the stomach was too tacked down to do gastro-enterostomy, if advisable, the wound was closed with deep sutures through all the layers, and skin sutures.

FURTHER NOTES ON PROGRESS:

December 1st, 1907: Patient had a long period in which she was under the influence of morphia till she died to-day.

She was practically always under the influence of morphia as without this drug she was in excruciating pain.

Name Bella. M K. Age 21. Disease Result



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Pulse &	144	150	120	122		120	104	120	120	118	118	120		104	124	120	120	128	130	128	120	Pulse &
Resp. m	24	28.	24	80	14	14	22	24	14	20	24	24	24	20	26	12	20	20	20	20	20	Resp. m
Resp. &	36	34	80	26		20	20	26	12	22	20	20		28	20	12	20	20	20	16	18	Resp. &
Motions		0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	Motions
Urine, ozs.																						Urine, ozs.
Sp. Gr.				1/111	1/111																1/111	Sp. Gr.
Reaction				Colonel Gr	Eruca	Colonel Gr															Colonel Gr	Reaction
Chlorides				Eruca		Eruca	Eruca	Eruca	Eruca	Eruca	Eruca	Eruca	Eruca			Aloes Pill	Aloes Pill	Aloes Pill				Chlorides
Albumen				Colonel		Colonel	Colonel	Colonel	Colonel	Colonel	Colonel	Colonel	Colonel			Colonel	Colonel	Colonel			Colonel	Albumen
Day of Dis.																						Day of Dis.

R. MITCHELL & SONS, LITHO. 20 CLYDE STREET, EDINBURGH

Name Bella. M K. Age 21. Disease Result

1907 Nov.	24	28	29	30
Pulse m	146	136	120	116
Pulse e	140	160	120	
Resp. m	8	14	12	14
Resp. e	12	16	12	
Motions	0 0	1 0	0 0	0
Urine, ozs.				
Sp. Gr.				
Reaction				
Chlorides				
Albumen		trace.		
Day of Dis.				

TEMPERATURE FAHRENHEIT'S SCALE. 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

TEMPERATURE CENTIGRADE SCALE. 41° 40° 39° 38° 37° 36°

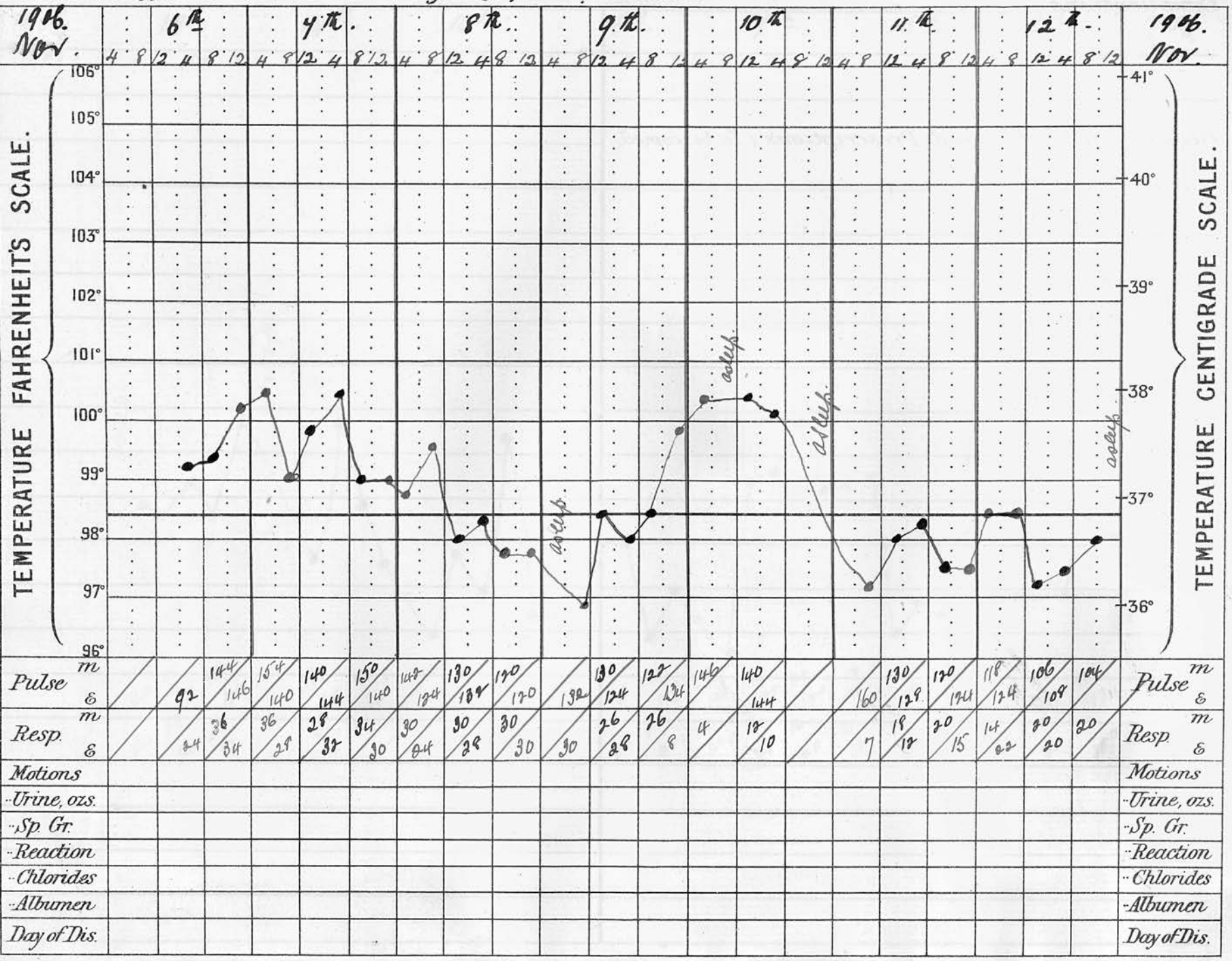
24 Nov. 1/6 Mixt. Sulph. Qu. Inj. Pot. Iod.

28 Nov. 5 50 Min. 10 30 " 1/6 Mixt. Sulph. Qu. Inj. Pot. Iod.

29 Nov. 9 Am. 1/6 Mixt. Sulph. Qu. Inj. Pot. Iod.

R. MITCHELL & SONS, LITHO. 20 CLYDE STREET, EDINBURGH

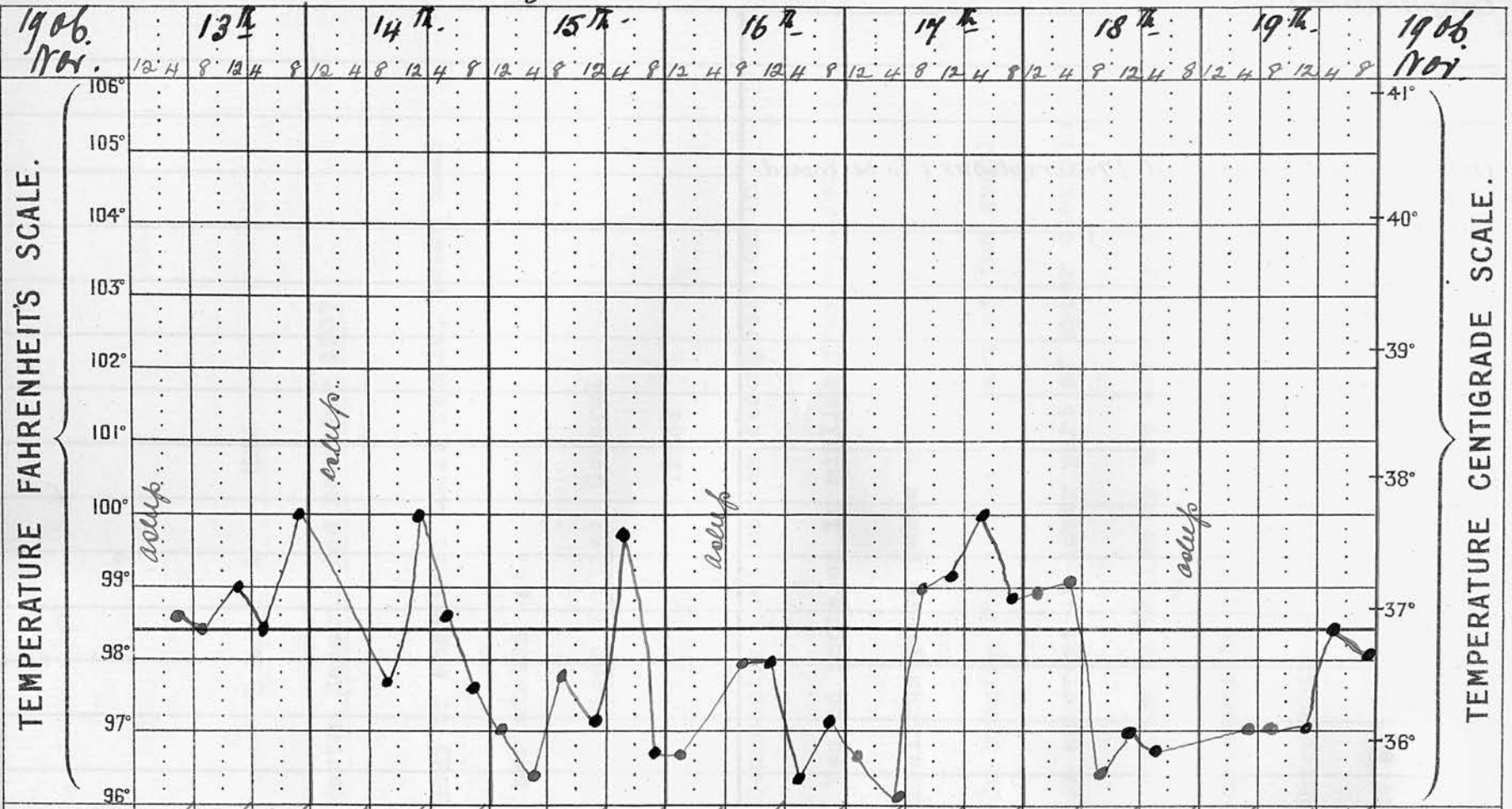
Name Bella. M K. Age 21. Disease Result



Pulse m				144	154	140	150	148	130	170		130	122	146	140			130	120	118	106	104		Pulse m
Pulse e		92		146	140	144	140	124	132	170	132	124	134		144		160	128	124	124	108			Pulse e
Resp. m			24	36	36	28	34	30	30	30		26	26	4	12			18	20	14	20	20		Resp. m
Resp. e				34	28	32	30	24	28	30	30	28	8		10		7	12	15	22	20			Resp. e
Motions																								Motions
Urine, ozs.																								Urine, ozs.
Sp. Gr.																								Sp. Gr.
Reaction																								Reaction
Chlorides																								Chlorides
Albumen																								Albumen
Day of Dis.																								Day of Dis.

R. MITCHELL & SONS, LITHO, 20 CLYDE STREET, EDINBURGH

Name Bella. Mc K. Age 21. Disease Result



	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8
Pulse m																																	
Pulse &	124	118	118		160	130	120	120	126	110	104	120	140	140	184	144	118	120	116	120		130	124	132									
Resp. m																																	
Resp. &	24	24	24		4	8	12	20	20	22	19	24	20	20	24	16	16	24	16		20	20	22										
Motions																																	
Urine, ozs.																																	
Sp. Gr.																																	
Reaction																																	
Chlorides																																	
Albumen																																	
Day of Dis.																																	

R. MITCHELL & SONS, LITHO. 20 CLYDE STREET, EDINBURGH

B E L L A McK

Post Mortem Report: 2nd December 1907

Body of emaciated adult female, looks much older than her stated age.

Rigor Mortis: General

Lividity: Trace

Commencing post mortem decomposition in abdomen. Healed incision in midline from ensiform to below umbelicus;supra pubic scar.

On opening the abdomen a part of the small intestine is adherent to lower part of upper cicatrix. The Great Omentum is rolled up and united by firm stringy adhesions to inner aspect of wound. On breaking through these adhesions a small area is opened into situated about 3½ c.m. below the tip of the ensiform cartilage, where purulent necrotic tissue is present forming an abscess cavity which is

bounded in front by the parietal peritoneum, and below by the Great Omentum; above by the under surface of the liver, and behind leads into the large cavity containing acrid foul stomach contents.

The general peritoneal cavity contains serous fluid. Pouch of Douglas contains serous fluid. The peritoneum throughout retains its lustre and shews no evidence of peritonitis.

Arrangement of Viscera: Intestine alone is visible.

On removal of the abdominal contents, the abdominal organs in the upper hemisphere are seen to be matted together by strong adhesions. The upper surface of the diaphragn feels almost cartilagenous and has an opaque white appearance, due to extensive carcinomatous infiltration.

On breaking down the adhesions uniting the lobes of the liver to neighbouring organs umbilicated

nodules of carcinoma are seen studded over the under surface of the liver.

The sinus described is found as suspected to communicate with the cavity of the stomach, into which a large opening now leads, since the adhesions have been broken down. The stomach is here denuded of its mucous coat and in place of this membrane a shaggy surface exists, formed of the surface of breaking down neoplasm, which extends into the Gastro-hypatic Omentum, forming a large stony mass.

Oesophagus in lower part is surrounded by the growth, but does not appear to be narrowed.

Pyloric Ring. This is infiltrated by the disease and its calibre slightly narrowed.

Duodenum: The first part is also infiltrated.

Papilla of Bile and Pancreatic Ducts readily found. From them mucous and bile are

readily expressed. A probe passes readily up the common duct, the walls of which are pressed upon by the neoplastic tissue, but do not appear to be infiltrated.

Pancreatic Duct: Pervious lumen.

PANCREAS:

On section through its long exis is found to be incorporated in an extensive mass of new growth which is carcinomatous in appearance.

This neoplasm is seen surrounding, invading and matting together the pancreas, spleen and left Supra Renal body and upper pole of the left kidney, diaphragmatic and retro-peritoneal glands.

JEJUNUM is found united to the mass, otherwise the small intestine appears healthy.

APPENDIX:

Retrocaecal, and dips over the pelvic brim.

LARGE INTESTINE: Sigmoid united by old fibrous adhesions.

Pelvic contents matter together by old adhesions.

In region of the left ovary a blood cyst is opened into on breaking down these adhesions.

UTERUS: Healthy.

POUCH OF DOUGLAS: Floor is covered by cheesy-like organising exudate.

HEART: Very small. It shews diffuse general thickening of the epicardial lining.

CORONARY VESSELS are thickened, tortuous and shew advanced atheromatous degeneration.

RIGHT AURICLE: Foramen ovale closed. Tricuspid orifice normal. Pulmonary valve healthy and competent.

MITRAL ORIFICE admits two fingers.

AORTIC ORIFICE: competent. The Aortic Valves show diffuse thickening and early atheroma.

Myocardium is atrophied, pale and friable. Cloudy swelling and advanced diffuse fatty degeneration.

L U N G S:

Bronchial Glands are infiltrated with secondary carcinoma.

Both Lungs are crepitant and show some patches of hypostatic congestion.

KIDNEYS:

Are embedded in a mass of carcinomatous tissue.

Left Kidney: Pelvis is infiltrated by carcinoma, nodules of which are studded irregularly over its surface and are seen infiltrating the kidney substance.

Right Kidney: Early carcinoma studding the pelvis.

SUMMARY

This is a case of Carcinoma of Pancreas involving the stomach, spleen, kidneys, supra renals, liver, diaphragmatic and abdominal lymphatic glands and small intestine.

There is no evidence of malignant disease in pelvic viscera, which have been matted together as the result of former operation.

The abdominal lymphatics and lymph channels in the lower part of the abdomen are virtually devoid of carcinomatous disease.

MICROSCOPIC EXAMINATION

Very unfortunately the microscopic slides of these specimens have been mislaid in the Pathological Department and thus I have been unable to reproduce them photographically or make a personal report

on them; however Dr Wade assures me that there was not the slightest doubt in his mind but that this was a case of carcinoma.

It will be seen that the patient remained quite well for 9 months, and then began to suffer from digestive and stomach symptoms. These abated for a month under appropriate medical treatment, and then re-asserted themselves with marked severity; so much so that latterly she had to be kept almost always under the influence of morphia.

The presence of albumen and blood in the urine is to be accounted for by the fact that the malignant disease had commenced to invade the kidneys.

The disease ran a fairly rapid course, and within 4 months of the first appearance of the digestive symptoms the patient died miserably.

The post mortem findings are of very considerable interest.

In the first place the patient is reported to be suffering from a primary carcinoma of the pancreas, which has extended to the whole of the surrounding structures.

Another interesting point is the entire absence of any trace of malignant disease in the pelvic lymphatics.

If metastasis had occurred from the ovary, one might reasonably expect some trace of the neoplasm in the path of the pelvic and lumbar lymphatics, although it is not invariably the case that, when a malignant metastasis occurs, its lymphatic pathway should also become affected by the disease.

The following points must now be considered:

I. Is the disease affecting the ovaries in

this case an endothelioma, or simply an ordinary carcinoma?

From the pathological examination made from numerous sections taken from both tumours, I have no doubt but that this is a true case of endothelioma, and I may say this opinion is also held by Mr Muir of the Edinburgh University Pathological Department, who primarily reported on this case, and who states "I am of opinion that this is a case of Lymphatic Endothelioma undergoing extensive colloid degeneration".

II. Glockner states that a diagnosis of endothelioma is not warranted unless primary carcinoma in some other organ has been excluded.

It is of course impossible to definitely state, in this particular case, that the primary condition in the Pancreas was not present at the

time of the operation on the ovaries, but if it was present at that time it gave rise to absolutely no symptoms - from the first appearance of the ovarian trouble till the advent of pain and stomach symptoms, being just about 12 months - therefore in my opinion one is practically justified in assuming that the disease in the ovaries antedated that in the pancreas, and that metastasis did not occur in a downward direction, although Osler & McCrae, in their book on "Cancer of the Stomach" quote several cases of what they call "latent cancer".

III. Was this a case of primary Carcinoma of the Ovary in which metastasis occurred later in the pancreas and surrounding structures?

The pathological findings are distinctly against this view, and this is also made somewhat improbable by the fact that no trace of malignant

disease could be found in the lymphatics leading from the pelvis.

Dr Wade in his post mortem report states the pancreatic condition to be primary, therefore I think one warranted in coming to the conclusion that the disease affecting the pancreas did not have its starting point in the ovary.

IV. The only conclusion left then is that here we are dealing with a case in which two distinct forms of cancer have appeared in the same patient.

Some authorities hold that one form of cancer produces immunity to any other form.

Carless in his paper on the Endotheliomata quotes a case of what he states emphatically to have been a large round celled Sarcoma of the testis, and yet the patient died within two years of what was apparently just as definite an endothelioma of the

liver and kidney.

Leitch reports a case of mixed metastases from a double primary Carcinoma.

Taylor & Teacher report a case of double tumours of the Uterus, Thyroid, Liver and Ovary.

Haaland records a case of a spindle-celled Sarcoma produced during the propagation of an Adeno Carcinoma of a mouse.

C A S E II.

NAME: Mrs Mary P

AGE: 55 years

RESIDENCE: 30 Roseneath Terrace, Edinburgh

OCCUPATION: Housewife

LENGTH OF TIME MARRIED: 13 years. No children. No miscarriages.

ADMITTED: Admitted to Ward 36 R.I.E. on 14th November 1907.

COMPLAINT: Since April 1907 there has been a persistent yellow somewhat watery dsicharge from Vagina.

Two months ago on 20th September there was a discharge of blood with some clots, resembling the return of a period. This haemorrhage lasted for 1 - 2 days. On 20th October, just a month later there was another discharge of blood, which also cleared up in a day or two.

HISTORY OF PRESENT ILLNESS

Since April 1907 she has been troubled with a thin yellow discharge which has been persistent.

During this period she has also lost a considerable amount of flesh and has become very thin: before her illness she weighed over 8 stone, but now weighs only 6 stone, 12 lbs.

Though not confined to bed she has felt very weak for some months, and has in consequence only been able to do light housework, and has been compelled to rest herself during the afternoons.

On September 20th 1907 she had what she considered to be "a return of her periods", there being a discharge of blood with some clots which lasted one or two days and then disappeared.

On October 20th 1907 there was a return of this discharge of blood which again disappeared in one or two days.

With the exception of these two occasions she has not had any discharge of blood, since her menopause 10 years previously.

There has not been any pain associated with the present illness, only a "bearing down" feeling and one of general discomfort and debility.

MENSTRUATION:

Commenced at 15 years

Ceased at age of 45, i.e: 10 years ago.

Previous to Menopause:

Periodicity: 28 days

Duration: 4 days

Amount: moderate

No Dysmenorrhoea

INTERMENSTRUAL DISCHARGE:

Since April there has been a watery yellow discharge; not excessive in amount but persistent, but with no bad odour.

PREGNANCIES: None

MICTURITION: Normal

DEFAECATION: Chronic Constipation

GENERAL HEALTH:

Until New Years Day of 1907 she had been very healthy; but on that day she had to call in a doctor, who said she was suffering from an influenzal attack.

When a child she suffered from measles, but has never had scarlet fever, rheumatic fever, or chorea.

In October last (1907) she had an attack of pleurisy which kept her confined to her bed for a week, but she has recovered entirely from this.

There is no palpitation or breathlessness; or history of colds or other respiratory troubles.

FAMILY HISTORY:

Father died aged 75; Senile decay

Mother died aged 65; Chronic Rheumatism

3 Brothers: 2 dead

1 Brother died suddenly at sea from fits

1 " " Painters Colic

1 " alive and healthy

1 Sister died aged 9, Low Fever

Husband is a healthy man.

PHYSICAL EXAMINATION:

General Appearance: Patient is thin and anaemic looking.

Height about 5 ft.

Weight 6 stone, 12 lbs.

Her arms and legs are very thin and her body is emaciated. Complexion rather muddy.

STATE OF MAMMAE:

The Mammae are represented by two prominent nipples, there is practically no mammary tissue owing to the emaciation.

ABDOMEN:

Inspection: A uniform swelling of the abdomen can be seen rounded and prominent.

Palpation: This swelling passes down into the pelvis and is smooth, rounded and firm in consistence.

Percussion: The note is dull all over the tumour area, but resonant in the flanks. There is no evidence of free fluid.

Auscultation: Nothing to note.

VAGINAL EXAMINATION:

Vagina: The orifice admits two fingers. The walls are dry and parchment like.

Uterus: High placed

Vaginal portion of Cervix: Small and high up. Fornices almost obliterated. Through the Fornices a semi-solid swelling is to be felt.

BI-MANUAL EXAMINATION:

A large semi-solid tumour is felt.

CIRCULATORY SYSTEM:

Subjective Symptoms: None

Physical Signs: Inspection. Apex beat visible in 5th interspace 3½ inches from mid-line.

In supra sternal notch arterial pulsation is well marked.

Percussion: The heart is not enlarged.

Auscultation: In mitral area the first sound is replaced by a soft systolic murmur, second sound closed. In The remaining areas the sounds are closed.

RESPIRATORY SYSTEM:

Subjective Symptoms: None.

Physical Signs: Inspection. The emaciation is extreme; clavicles and ribs standing out prominently. The Chest is rather flat.

Percussion: There is a slight impairment of the percussion note over the left infra clavicular region. Right infra clavicular region resonant.

Auscultation: The breath sounds are harsh and vesicular in character, with some sibilant rhonchi over the left side.

Urinary System:)
) Nothing to note
Nervous System:)

DIAGNOSIS: Ovarian Tumour

PROGNOSIS: Unfavourable

TREATMENT: Operative

O P E R A T I O N

By Mr Brewis 20th November 1907

Anaesthetic: Chloroform and Ether Mixture 1-2.

ABDOMINAL SECTION:

Incision made in middle line 4 inches long and the abdominal cavity opened. The hand was then

passed into the cavity and a tumour was found which was adherent to the abdominal wall laterally and in front: these adhesions which were not very dense were gently broken down with the finger and the limits of the tumour defined.

This was now gently raised out of the abdominal cavity and its dimensions were found to be about the size of a cocoa-nut. There were found to be some adhesions on the under surface of the tumour, between it and the rectum, and these were gently freed. The infundibular pelvic ligament, and what remained of the tubes and round ligament were legated, and the tumour was removed, and the peritoneum was carefully sutured with fine cat-gut over the raw surface of the stump.

The right side was then examined and a tumour about half the size of that on the left side was discovered. It was adherent in all directions

and to the side of this tumour, and apparently growing from it, was a large cheesy mass which looked distinctly malignant. The vermiform appendix was found to be adherent to the ovary.

The surrounding peritoneum was now discovered to be studded with a number of small white nodules, which appeared to be secondary deposits.

After a considerable amount of difficulty this tumour was freed from its adhesions and removed in the ordinary manner.

The appendix having been first excised. Owing to the dense adhesions there was a considerable amount of oozing from the bed of the tumour and to cope with this the pelvis was packed with iodoform gauze, the free end of which was carried through the abdominal wound, which was closed in successive layers by cat-gut sutures. After the abdominal wound was closed blood was found to be oozing from

the vagina, apparently coming from uterus, and in consequence the vagina was plugged with iodoform gauze.

The patient had an uninterrupted convalescence and was discharged on the 40th day feeling well.

FURTHER PROGRESS:

February 20th 1908. The patient was seen on this date, i.e., just 3 months after the operation, and she was then found to be in a dying condition.

On vaginal examination the whole pelvis was found to be occupied by a hard mass which was incorporating the uterus.

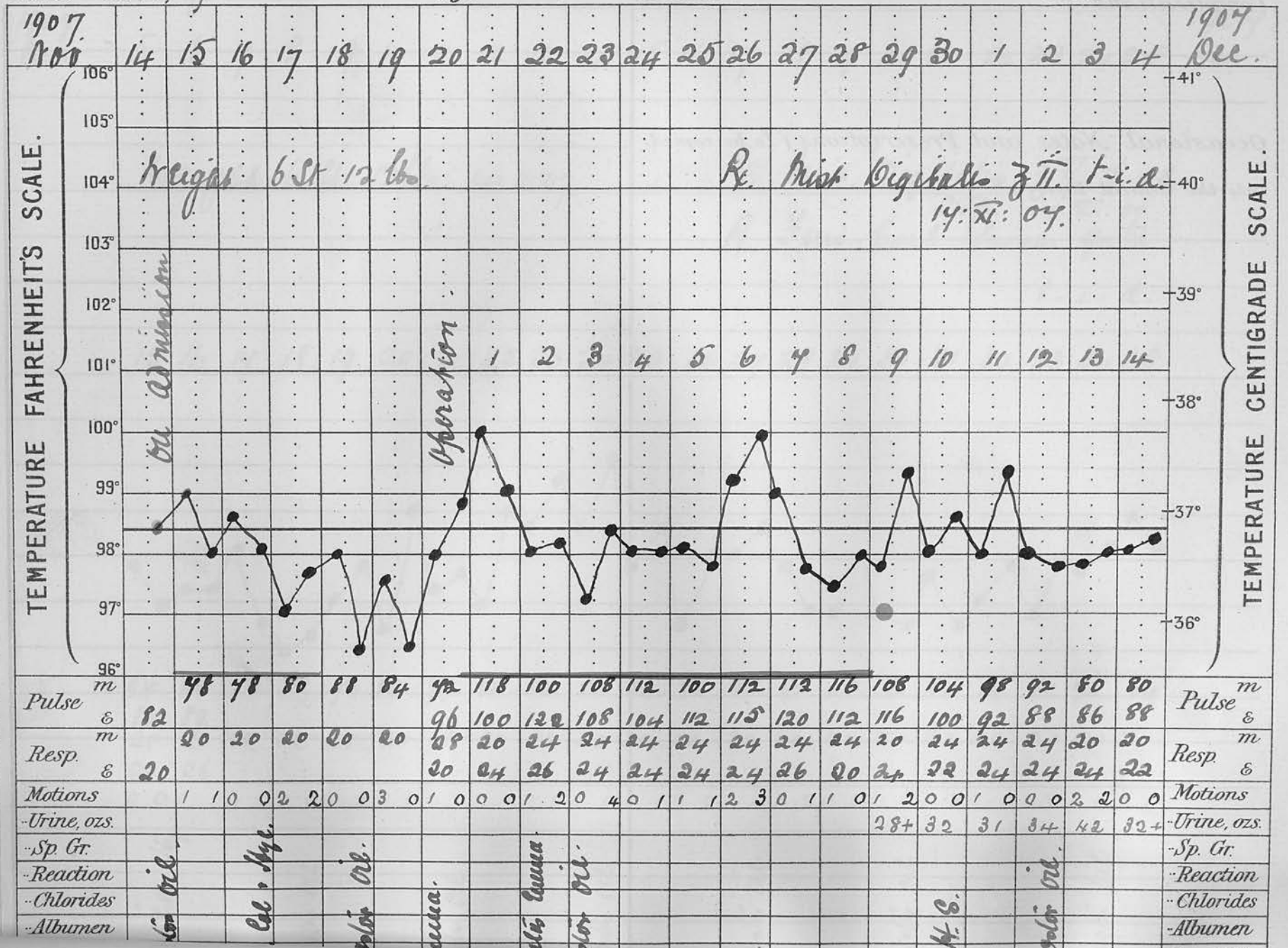
Lying free in the vagina was a mass of macerated tissue about the size of a crown, evidently part of the tumour.

Pathological Report on this mass by Dr James Ritchie, Royal College of Physicians Laboratory:

"The mass is evidently part of a tumour, "but it is so macerated that the cells hardly stain "at all. There are the remains of blood vessels "present, and the badly staining cells have a sar- "comatous look, but it is impossible to give a "diagnosis."

The patient died a few days later and an autopsy could not be obtained.

Name Mrs. P—. Age 55. Disease Result


1907 Nov
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4
1907 Dec.
TEMPERATURE FAHRENHEIT'S SCALE.
106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°
TEMPERATURE CENTIGRADE SCALE.
41° 40° 39° 38° 37° 36°
Weight 6 St 12 lbs.
Re. Mist. Digitalis ℥ II. t-i.d.
14: XI: 04.
On admission
Operation
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Pulse m 78 78 80 88 84 92 118 100 108 112 100 112 112 116 108 104 98 92 80 80
Pulse ε 82 96 100 122 108 104 112 115 120 112 116 100 92 88 86 88
Resp. m 20 20 20 20 20 28 20 24 24 24 24 24 24 24 20 24 24 24 20 20
Resp. ε 20 20 24 26 24 24 24 24 26 20 24 22 24 24 24 22
Motions 1 1 0 0 2 2 0 0 3 0 1 0 0 0 1 2 0 4 0 1 1 1 2 3 0 1 1 0 1 2 0 0 1 0 0 0 2 2 0 0
Urine, ozs. 28+ 32 31 34 42 32+
Sp. Gr.
Reaction
Chlorides
Albumen
Cal. Syr.
Bol. ol.
Bol. ol.
Bol. ol.
Cal. Syr.
Cal. Syr.
Cal. Syr

Name Mrs P—. Age 45. Disease Result

1904 Dec	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	1904 Dec
			Weight	6 St.	12 lbs.	14: XI: 07.							℞ Mist. Digitalis									
																	Stop.		14: XII: 07.			
													℞ Fluid.	Carb.		Sacch.			Gr. X			
																			t-i-d.			
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Pulse m	64	84	84	80	76	82	94	80	82	88	84	90	88	90	88	80	84	84	80	76	84	Pulse m
&	80	82																				&
Resp. m	20	20	20	20	20	20	18	20	20	20	20	20	20	20	20	20	20	20	20	20	20	Resp. m
&	20	26																				&
Motions	0 0	1 1	0 0	0 0	2 2	0 0	0 0	1 1	0 0	0 0	1 1	0 0	0 0	2 2	0 0	0 0	1 2	0 1	0 0	0 0	2 1	Motions
Urine, ozs.																						Urine, ozs.
Sp. Gr.																						Sp. Gr.
Reaction																						Reaction
Chlorides																						Chlorides
Albumen																						Albumen
Day of Dis.																						Day of Dis.

TEMPERATURE FAHRENHEIT'S SCALE. 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

TEMPERATURE CENTIGRADE SCALE. 41° 40° 39° 38° 37° 36°

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Name Mrs. P. Age 55 Disease Result

1907 Dec.	26	27	28	29	30
Pulse m &	76	80	80	90	80
Resp. m &	20	20	20	20	20
Motions	0	0	0	1	0	0	0
Urine, ozs.					
Sp. Gr.					
Reaction					
Chlorides					
Albumen					

TEMPERATURE FAHRENHEIT'S SCALE. 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

TEMPERATURE CENTIGRADE SCALE. 41° 40° 39° 38° 37° 36°

Weight 6 St. 12 lbs. 14:XI:07.

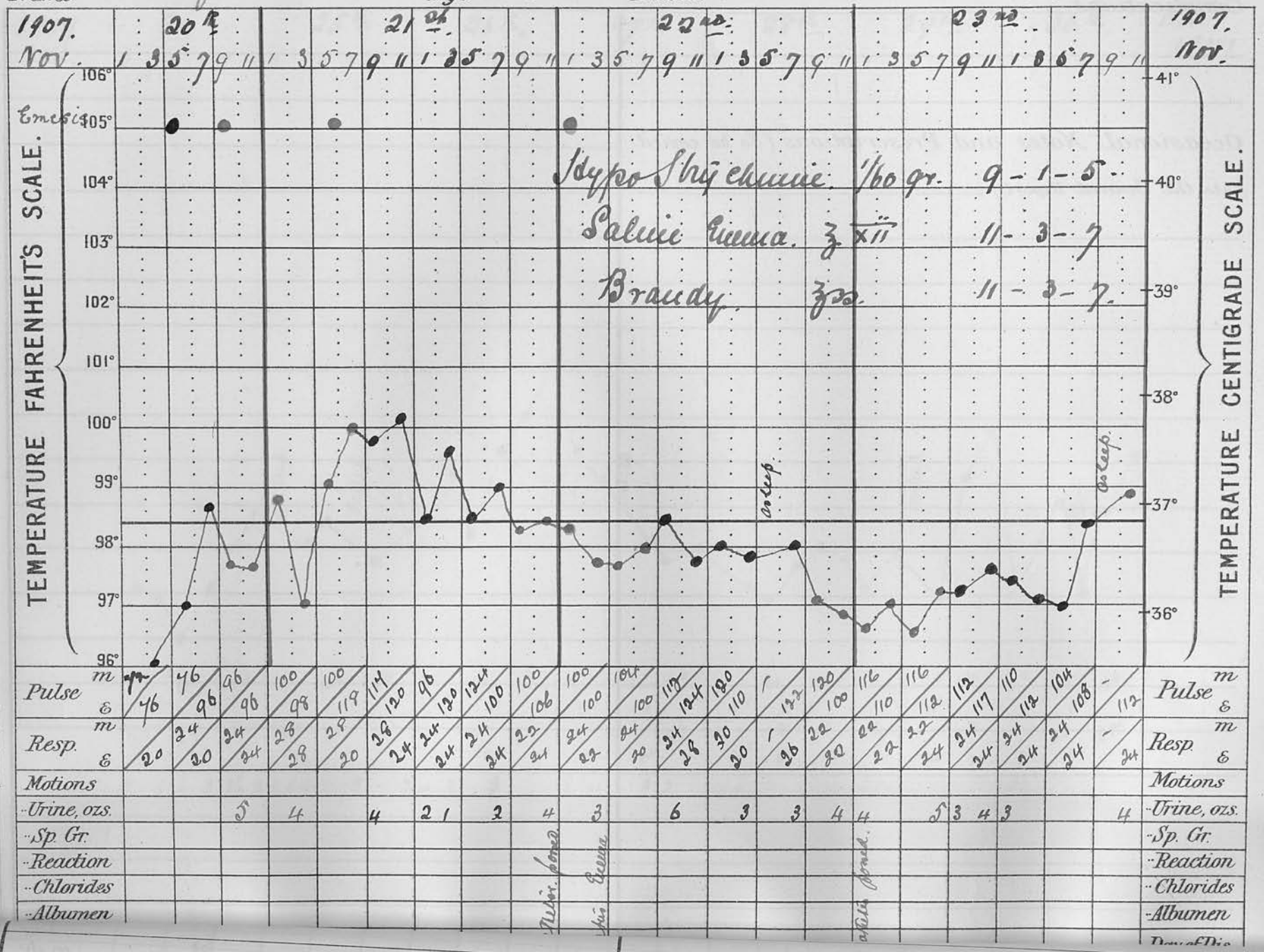
℞ Ferri Cart. Sacch. gr. X
t-i-d.

36 37 38 39 40

Discharged.

Pulse m & | Resp. m & | Motions | Urine, ozs. | Sp. Gr. | Reaction | Chlorides | Albumen | Day of Dis.

Name Mrs S—. Age 55 Disease Result



Name Mrs P—. Age 55 Disease Result

1907 Nov. 24th. 25th. 26th. 27th. 28th. 29th. 30th. Nov. 1907

3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11 3 7 11

TEMPERATURE FAHRENHEIT'S SCALE. 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

TEMPERATURE CENTIGRADE SCALE. 41° 40° 39° 38° 37° 36°

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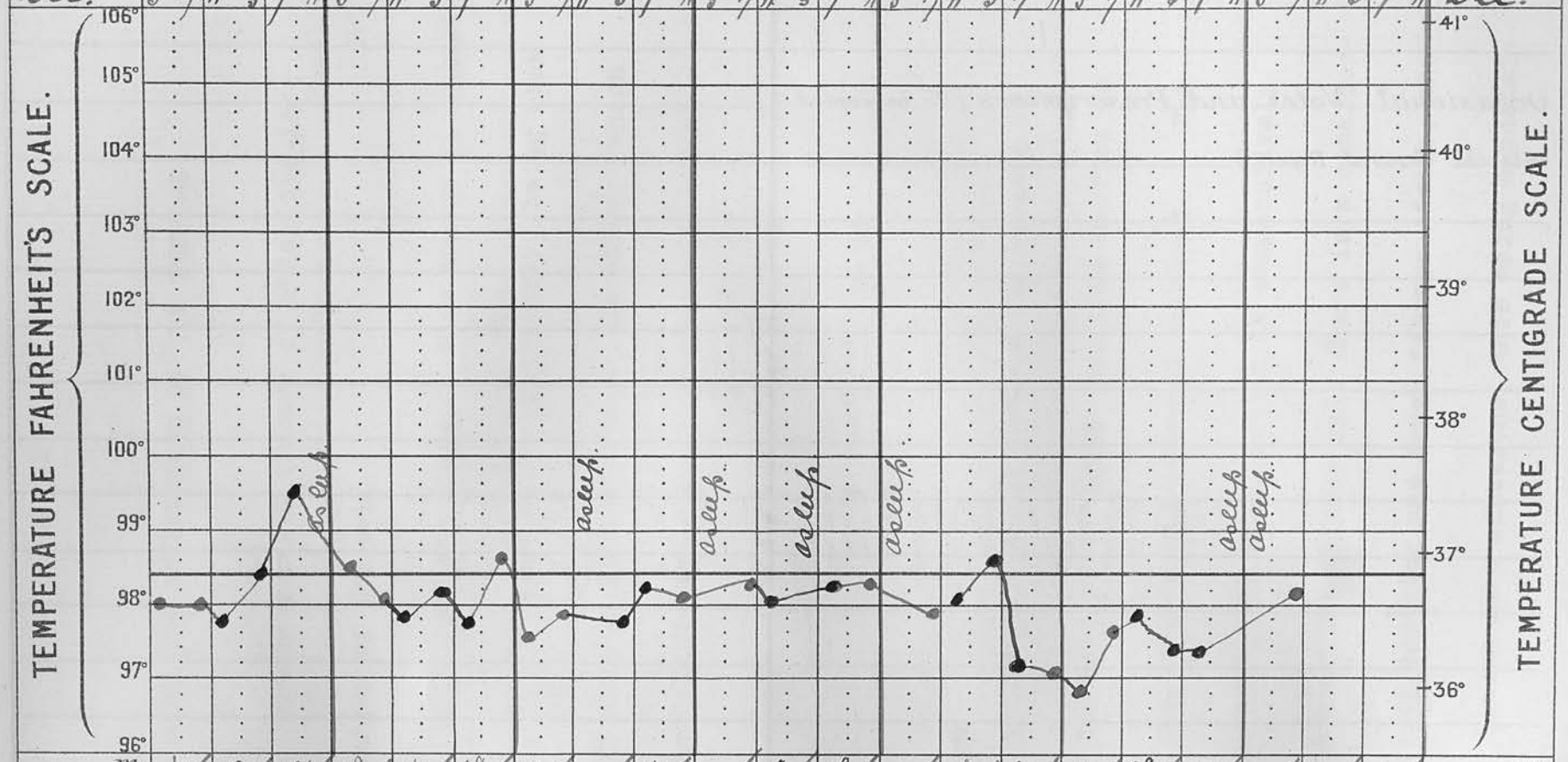
Name Mrs P. Age 55. Disease Result



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NAKED EYE APPEARANCES OF THE TUMOURS

Double ovarian tumours of which the left is the larger of the two.

Left Tumour: Shape. This tumour is almost circular and flattened antro-posteriorly, being much broader on one hemisphere than on the other, which is somewhat flattened.

Size: Diameter measures 19.7 cm.

Thickness measures 5.3 cm.

Weight: 11¾ oz.

Surfaces: To one surface the remains of the broad ligament is attached, and this surface is of a dull grey colour and somewhat wrinkled. The surface overlying the thin portion is comparatively smooth, but over the thicker half there is a considerable amount of vascular and rough fibrous tissue, the remains of broken down adhesions, this being especially well seen over the thickened edge of the tumour.

Over the centre of this raised area is a small clear area over which the capsule is thinned and stretched, and which looks like a cyst, but is in reality a focus of myxomatous degeneration.

On the opposite side of the tumour the capsule is much more wrinkled, and thrown into two transverse folds reaching almost across the neoplasm. Running transversely to these folds, and just beyond the junction of the thicker and more solid portion of the tumour is an irregular band of slatey blue colour. This surface of the tumour has a mottled yellow grey appearance. The yellow patches are mostly over the thickened portion, and are raised above the surface. They are of firm consistence and consist of solid masses of tumour growth.

The broader edge of the tumour consists of a solid mass of growth extending for about 3 inches along the convex border and from 1½ - 2 inches over

either flat surface.

Beneath the capsule can be seen the lines of the blood vessels, though no haemorrhages are present.

On Section: The capsule is seen to be composed of a thick firm membrane, firmly adherent to the mass of tumour growth.

The greater part of the tumour consists of a large cyst, the walls of which are lined with a friable and thick membrane, which is much degenerated in parts, and which has been the seat of extensive haemorrhage both into the wall and the cavity of the sac. Between the membrane and the capsule is a soft irregular network with irregular fibrous bands intersecting it, and probably the seat of myxomatous change. Towards the flat half of the tumour the inner wall of the capsule is lined by a smooth shining membrane which shews little evidence

of degeneration or haemorrhages. The actual neoplasm itself lies in the opposite half of the sphere and is a somewhat elongated, firm, yellowish grey mass, closely applied to the capsule on the one hand, while the other side merges gradually into the degenerated and haemorrhagic covering of the sac, while towards the centre it is raised and very well defined.

About its centre and towards the one end are two empty cyst cavities through which the section has passed.

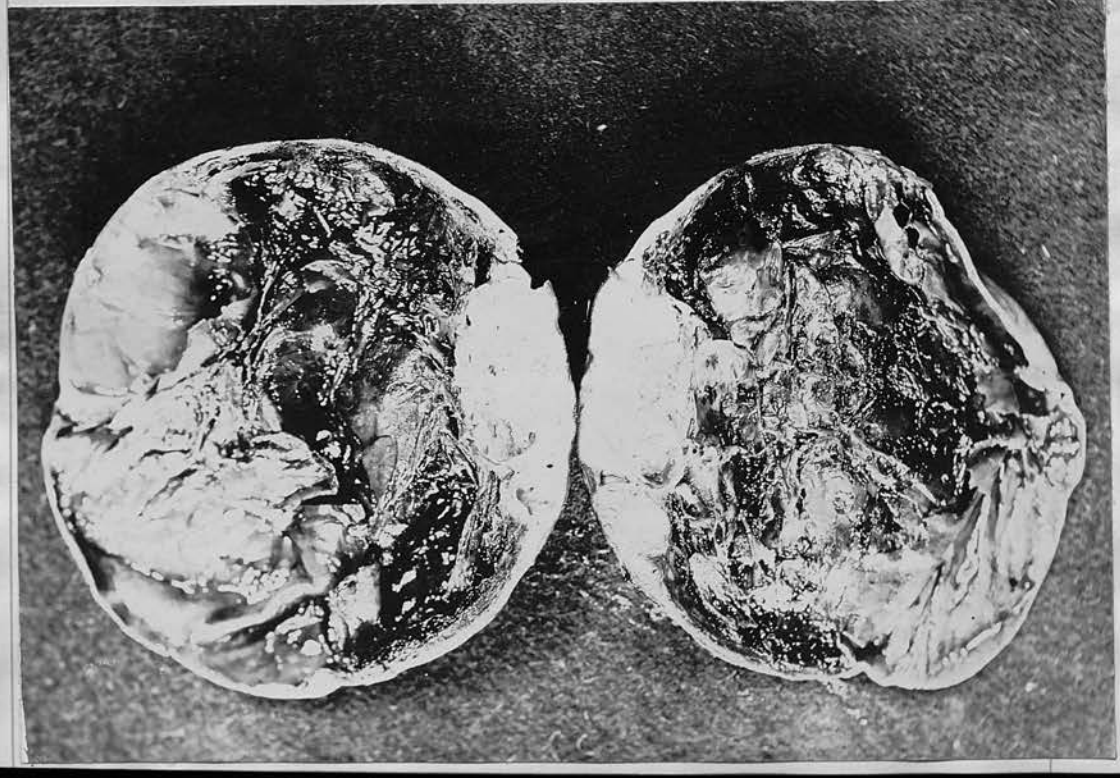
On close examination the actual tumour mass appears to be made up of cellular tissue, between which is a fine network of fibrous tissue, while here and there irregular and branching bands of fibrous tissue can be seen extending from the capsule and breaking up in the tumour.

There are no evident harmorrhages in the actual tumour mass, but it is infiltrated at the two

LEFT OVARY

Surface View

Sectional View



poles with considerable haemorrhages.

In one half of the section the solid mass seems to be spreading along the capsule towards the centre of the cyst-like cavity .

The Right Tumour: This tumour is much smaller and more solid than that of the left side. It is somewhat horse shoe shaped and consists of two separate masses united by fibrous bands.

Size: This tumour measures 10.2 x 7.8 x 5.6 cm.

Weight: 4½ oz.

The two portions into which the tumour is divided are of unequal size, but both are extremely nodular on the surface, and the larger portion presents two large cyst-like cavities on its outer surface.

The Colour varies from a dull yellow to dirty grey.

As already stated the surface of both masses is extremely nodular, the larger mass being especially so, and here and there are the shaggy remains of adhesions.

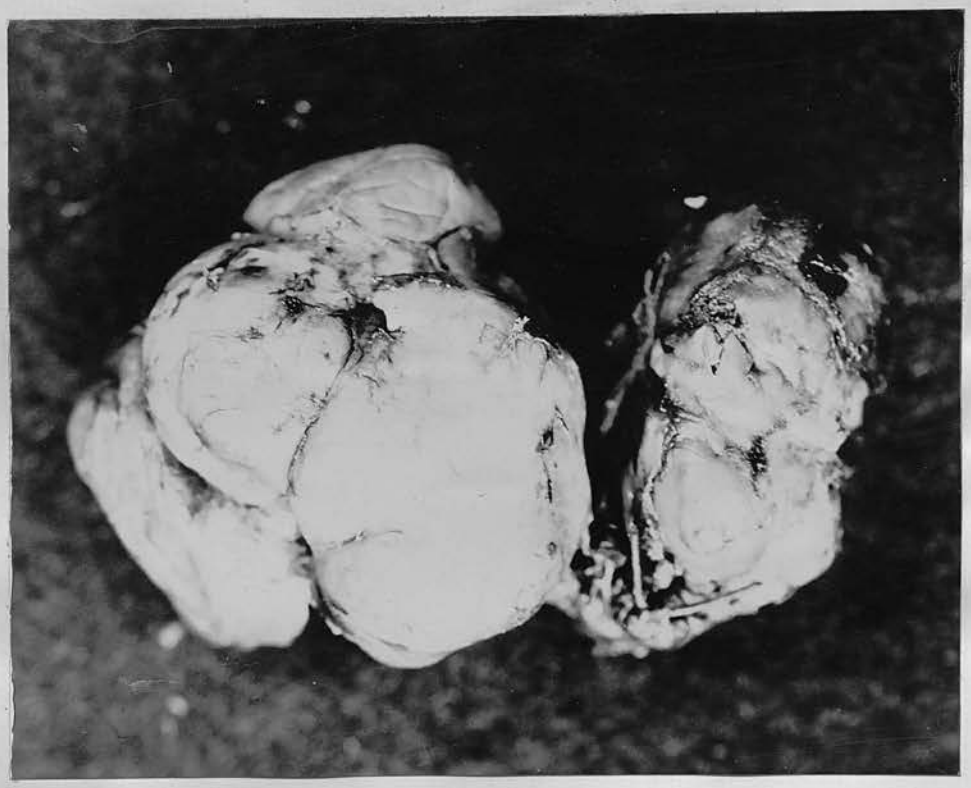
On the more convex and nodular surface are a series of flat fibrous bands - passing from the larger to the smaller mass - and beneath the attachments to the larger mass there has been some haemorrhage.

Just below the capsule can be seen the lines of blood vessels, and here and there the remains of small haemorrhages in various stages of absorption.

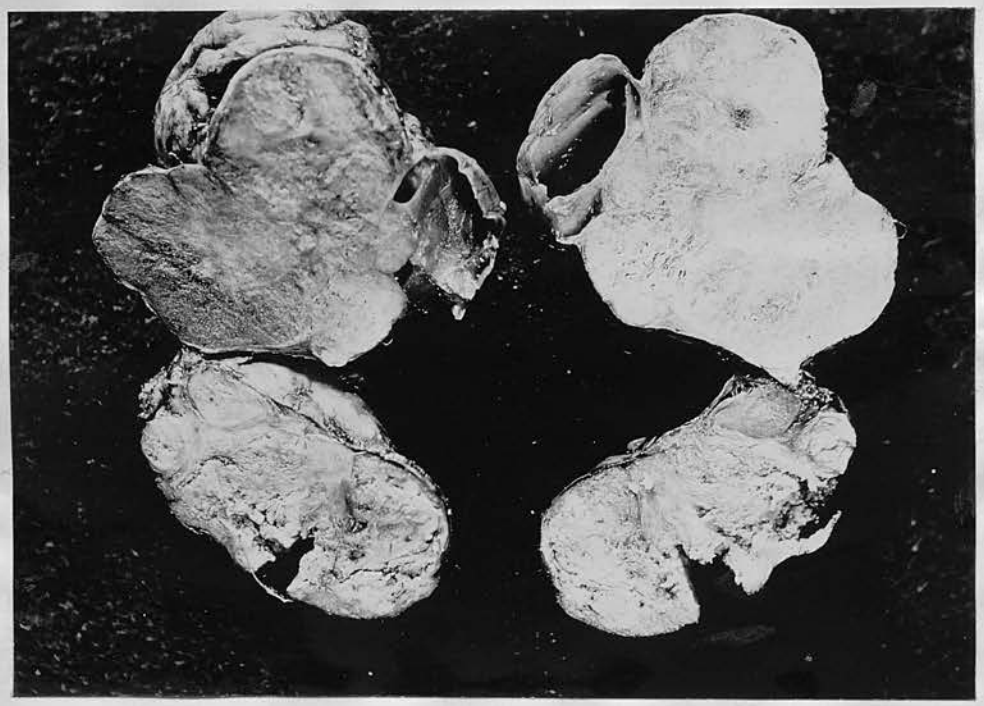
On Section: The Capsule is seen to be a moderately thickened fibrous membrane, intimately adherent to the tumour mass. From it fibrous bands radiate into and subdivide the tumour. Towards one pole of the smaller tumour these fibrous bands have encircled two small islets of tissue, the centres of

RIGHT OVARY

Surface View



Sectional View



which shew early caseation.

The greater part of the smaller tumour, between its centre and the capsule, is necrotic and under the centre of the capsule it has broken down. There are a few isolated and small areas of colloid change, but the greater part is undergoing patchy necrosis.

The larger tumour shews towards its centre an irregular patch of colloid change, while scattered over its surface are larger and smaller patches of necrosis in its various stages.

On its convex border is a large clear cyst-like cavity filled with myxamotous tissue and presenting no evident structure.

MICROSCOPIC EXAMINATION

Under low power the tissue has the appearance of normal Ovarian Stroma invaded by new growth.

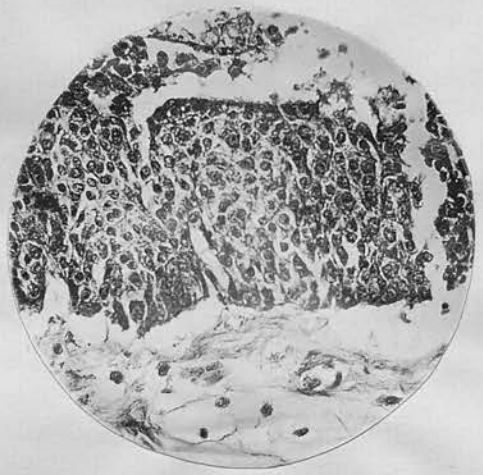
Certain areas appear to be Lymph Spaces, several of which contain masses of new growth, the main mass of which extends across the greater part of the field. These points are well shewn in the accompanying microphotograph.

Low Power (x 125)

High Power:

On examination of one of these masses of cells under the high power it is seen to comprise the endothelial lining of a large Lymph Space, from which owing to the shrinkage which has taken place

in putting the section through the various preserving and hardening fluids, the mass of cells has retracted.



Microphotograph A. (x 480)

The cell mass forming a wide band running across the section is composed almost entirely of cells more or less uniform in size and structure, varying however from 9-11 micros in diameter.

The cytoplasm is abundant, well stained and granular in appearance.

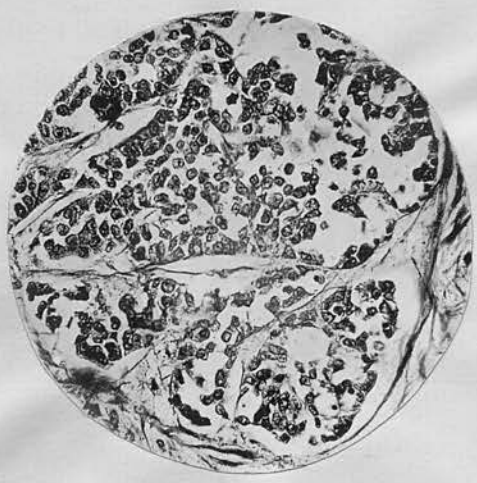
The nuclei are large, and as a rule placed eccentrically in the cell, and are rich in chromatin and coarsely granular.

The true Neucleoli or Karyosomes are distinctly visible, and in some of the cells false Nucleoli - the knots in the chromatin network - can be seen.

Intercellular substance is practically absent.

Many of these points are well seen in the accompanying microphotograph A.

At certain areas - as is well shewn in microphotograph B.



Microphotograph B. (x 480)

- the Section is seen to possess a delicate capillary stroma.

In several places the endothelial cells have retracted from the wall of the lymph spaces, but give evidence of their origin from the endothelial lining of the space. In several places towards the centre of the photograph the spaces are more or less filled with proliferated endothelium, forming an alveolar arrangement.

The whole appearance of the sections taken from both tumours strongly suggest that we are here dealing with an endothelioma arising from the endothelial lining of the lymphatics, and Dr Shennan of the Infirmary pathological department, who reported on the condition at the time of operation, is of the same opinion.

The particular section from which the photographs were taken, has passed through a more recent part of the tumour and caught the growing edge, where

the more typical appearance is seen, viz. the endothelium undergoing active proliferation.

There is nothing of outstanding interest in this case.

The age of the patient, about 55, being about the average age at which this disease makes its appearance.

This patient suffered from an early menopause, but it is interesting to note that she was somewhat later than the average girl in commencing to menstruate.

The onset here was again fairly rapid, extending in all over 7 months, with progressive emaciation and weakness, but an almost complete absence of pain.

There was comparatively speaking very little disturbance of the menstrual functions, with the exception of a slight, watery, non-foetid

Leucorrhoea, and on two occasions a slight haemorrhage; and it is interesting to note that these bleedings came on at exactly one month's interval, simulating the return of the menstrual periods.

One month before her admission she suffered from pleurisy. This would, taking into consideration the physical signs over the left infraclavicular region and the fact that metastasis was found to have occurred at the time of the operation affecting the peritoneum, make one suspicious that the pleurisy was possibly caused by a migration of the neoplastic cells to this situation.

Whipham, in reporting on 24 cases of Endothelioma in various situations, states that 33.3% had metastatic growths in the lungs, which of all organs proved to be the most frequently attacked by this form of metastatic growth. It seems likely, therefore, that Endothelioma also tends to spread by

means of the circulatory system.

As is so common in these cases the tumours were densely adherent to the surrounding structures.

Leopold was the first to report a case of this class of tumour of the ovary in the year 1874, but gave it the name of "Lymphangioma Cystomatosum".

Nothing more was heard of the condition till four years later, when in 1879 Marchand described two cases. And in the following 15 years only 9 cases have been recorded.

In 1894 an impetus seems to have been given to the study of this form of tumour affecting the ovary, as in that year no less than 9 cases were recorded, and two years later 8 cases were reported upon. The greatest number of cases recorded in any one year being in 1904, when 13 cases appear in current literature, and this is closely followed in 1902 by 11 cases. In all up till May 1907 there is a total record of 85 cases, which when the present two cases are added, gives a grand total of 87 cases of

Endothelioma of the Ovary. In going through the literature on this comparatively rare and interesting condition of the ovary one cannot but be struck by the scant attention it has received at the hands of English speaking scientists, as up till May of last year only 6 authenticated cases are reported in the English language.

FREQUENCY OF OCCURRENCE: It cannot be stated definitely that this collection of 87 cases includes all the cases of this condition which have been seen and operated upon. Bonney in 1904, and Kadygrobow in 1905 each report a case, but give no definite particulars.

Seeger in his inaugural address on solid ovarian tumours, amongst others describes 3 mixed tumours which he calls "Carcinoma Sarcomatosum". Probably one or more of these would now be classed

among the Endotheliomata.

Limnell in giving statistics of 50 ovarian tumours, speaks of 3 as being Endothelioma, but no report of these cases beyond the description of the specimens is to be found .

Jones in 1884 describes several endotheliomata of the ovary, but the pathology in her cases is very vague.

There is little doubt to my mind that were the numerous cases that have been reported of sarcoma and also of carcinoma of the ovary re-examined pathologically in the light of our present knowledge, a considerable number of them would now be classified as among the Endotheliomata.

When we come to study this collection of 87 cases from an age incidence one cannot but be struck by the wide limits between the ages of the various patients. We have the age given of 82 out of the

87 cases; we find the youngest sufferer to be aged 7, and the oldest 64 - both reported by Amann in 1894. If we examine the age incidence of all these cases we find the average age of all cases is 40 years.

The number occurring in decades is as follows :-

From 7 to 10	...	3 Cases
" 10 to 20	...	5 "
" 20 to 30	...	13 "
" 30 to 40	...	13 "
" 40 to 50	...	26 "
" 50 to 60	...	17 "
" 60 to 64	...	5 "

If we take the number occurring during periods of 5 years after the age of 20, we find :-

From 20 to 25	...	5 cases
" 25 to 30	...	8 cases
" 30 to 35	...	6 "
" 35 to 40	...	7 "
" 40 to 45	...	11 "
" 45 to 50	...	15 "
" 50 to 55	...	12 "
" 55 to 60	...	5 "
" 60 to 64	...	5 "

This shews the greatest number of cases to occur in the 5th decade, i.e. between 40 and 50. But if we compare the 10 years between 45 and 55 we find that there is one more case than between 40 and 50. The number occurring from 45 to 50 exceeds by 3 that of any other 5 years. From this we can gather that the bulk of the cases occur between the ages of 40 and 55, i.e. about the time of the menopause.

Apelt has pointed out that very much the same thing obtains with regard to sarcoma of the ovaries, and yet this is generally believed to be a carcinomatous rather than a sarcomatous age.

Heredity does not seem to have much , if any, bearing upon the aetiology, but Eberth and Spude have reported numerous examples in several generations of a family of mice.

O N S E T

When one looks into the literature one cannot but be struck with the rapid onset in this disease. Schurmann records a case in which only 2 weeks had elapsed since the onset of the symptoms.

Jonnesco's case first noticed a tumour one month previously.

Barrett's case only had symptoms for 6 weeks before being seen.

One of my cases noticed a tumour the size of a marble 2 months previous to two tumours nearly the size of an adult head being removed.

On the other hand Velits reports a case where the tumour had been known to exist for 9 years.

Barbour states that as a rule the condition grows rapidly, attaining the size of a child's head in periods varying from 1 to 12 months.

S Y M P T O M S

The Symptoms generally speaking are those of any other form of cancer.

Pain seems to be the most characteristic symptom. One would expect this, especially where the ovaries are affected and in consequence enlarged, as the mechanical pressure on the sacral nerves would quite account for this phenomenon, apart from the indefinite pain caused by the probable presence of adhesions. In those cases where there is no actual pain, one finds that many of the cases reported on sought medical aid because of a sense of fulness in the lower part of the abdomen.

In some cases it has been only the marked and rapid enlargement of the abdomen which has caused the patient to seek relief.

Probably the next most common symptoms are progressive emaciation, weakness and anaemia, and in

the later stages cachexia.

Graefe reports a case of ovarian endothelioma where there was considerable oedema of the lower extremities. This is probably accounted for by the fact that his patient was the possessor of a large left-sided ovarian cyst and that this was acting as a mechanical obstruction to the venous return flow. This is the only case that I can find where oedema was reported as a symptom.

The presence of free fluid in the abdominal cavity is also a very common symptom, in fact it is almost the exception to find - at any rate where the ovaries are the organs affected - that there is no ascites present.

The amount of the fluid has varied from 2 oz. in my case No. I. to 10 liters in Burckhard's case, and it has even been given as a cause of death (Kötschau).

Many authorities speak of this condition as being present, amongst others, Pick, Ribbert, Rosinski, Frankel, Jonnesco, Soubeyran, Barbour, Stauder, Bellati, Barrett,etc.

The fluid has varied from light clear coloured fluid to haemorrhagic pus.

Disturbances of Menstruation: seem to be by no means a constant factor in this condition.

Barbour quotes 29 cases in which the menstrual history was taken into account, and of these 29 cases there were only 13, or 44.9%, who suffered from menstrual irregularities, 9 from menorrhagia, and 4 from ammenorrhoea.

In my two cases:-

Case I. suffered from severe Dysmenorrhoea

Case II. from Menorrhagia and Leucorrhoea

Phillips' Case of Endothelioma of body of uterus suffered from menorrhagia, metorrhagia

and foetid leucorrhoea.

Jelletts Case of endothelioma of vagina was troubled with only slight leucorrhoea.

METASTASIS

Metastasis is comparatively speaking a common sequence of this disease.

New Growths have been found either pre or post operative in practically all parts of the body.

On the Uterus: Cullen, Bruckner, my case II.

On Fallopian Tube: Marchand and Pollak

In the opposite Ovary: Lange

On the Peritoneum: Pick, Jonnesco, Soubeyran, Stauder, Lange, Barbour, Schmaus, Barrett, and my case No. II.

In the Spinal Cord: Marchand

On the Omentum: Jonnesco

On the Rectum: Barbour

In the Lungs: Lange

In Retro-peritoneal glands: Olshausen.

In Barrett's case metastasis was found to have occurred in the vagina, inguinal region, body and legs.

In the present cases under consideration :-

Case I.

? In pancreas, stomach, spleen, kidneys, supra renals, liver, diaphragmatic and abdominal lymphatic glands, and small intestine.

Case II.

Peritoneum and uterus

The Uterus, bowel and omentum have also been involved by direct extension.

COMPLICATIONS

As one would expect complications are by no means rare, and when we are dealing with those cases in which endothelioma is involving the ovaries by far the most common complication, and the one most to be feared by the operator is the presence of dense adhesions.

Perforation of intestines with subsequent peritonitis occurred in Pomorski's and Mirabeau's cases.

Pneumonia complicated Papaioannou's case; pleuritic effusion which required repeated tapping in Lange's case.

Thrombosis of the illiac veins and the veins of the leg has been reported by Graefe and Phillips.

Oedema of the legs and feet by Graefe.

Lange's case of endothelioma of the ovary was complicated by a myoma of the uterus.

While in Phillips' and Backhaus' cases of endothelioma of the body of the uterus the trouble apparently started in a fibro-myomatous condition of that organ.

It is rather a strange coincidence that in two of the reported cases of endothelioma of the ovary,-those of Marchand and Amann - that organ was found to be lying in the sac of an inguinal hernia. An hernia of the ovary is comparatively speaking a rare condition, only about 400 cases having appeared in literature.

A possible aetological factor in these two particular cases might be traced to the irritation of the ovary while lying in the hernia sac.

Hardly a case has been studied that did

not show some form of degeneration,- cystic, myxomatous, hyaline and calcarious perhaps being amongst the most common,- while haemorrhagic infarct is by no means rare.

Again in studying this collection of cases one cannot but notice how frequently the condition has turned out to be bi-lateral.

If we deduct from these 87 cases 3, in which it is not stated whether only one or both ovaries were affected, it leaves us with a sequence of 84 cases, and of these the disease was bi-lateral in no less than 28, i.e. in 33.3% of the cases; while in several cases where one ovary was thought to be healthy, and had been allowed to remain in situ, that ovary has become the seat of disease at a later date (Lange). Pick reports a case where the supposed normal remaining ovary increased to the size of a

goose's egg within 4 months of the operation and then returned to normal. One can scarcely suppose this to be a recurrence in this particular case, the enlargement being probably due to some inflammatory manifestation.

Randolph reports an example of spontaneous arrest of growth and disappearance of an endothelioma.

These figures would tend to show how important it is, where a diagnosis of endothelioma of the ovary has been made, and where the remaining ovary has been left behind apparently healthy, or for any other reason, that the operator should keep such a patient under the closest observation for some considerable period, bearing in mind the possibility of recurrence, and the rapidity with which these tumours grow.

Hewlett states that endothelioma are of slow growth and show little tendency to metastasis.

My cases and those of others rather prove the contrary to be true, and this view is held by Hektoen and Riesmann.

Carless in his article on endothelioma quotes two cases where the testis - the homologue of the ovary - was the seat of this form of cancer.

In the first case, published by Wood, the patient's age was 43, when the right testis was removed for endothelioma. Two years later the left testis, which was apparently healthy at the time of the previous operation, had to be removed for the same condition, and two years after the second castration the patient died from endothelioma of the left kidney.

Case II. Reported by Sternberg, in which the right testis was removed for endothelioma, and three months later the patient died. On P.M. examination a general metastasis was found to have

occurred, affecting the lungs, the retroperitoneal and posterior mediastinal glands, the inferior vena cava and the liver. This is given as a case of endothelioma intravasculare.

A critical survey is made of 14 cases of endothelioma of the testis by Krompecher, and amongst others the following are some of his conclusions.

1. That most of the endotheliomata of the testis arise in the lymphatics. - This is apparently true also of the ovary.

2. That when they arise in the larger lymphatics it is easier to detect the endothelial origin of the cells than when they arise in the smaller lymphatics.

3. Two types of growth may be distinguished.

In one the development is of a diffuse type, the cells not being arranged in any special manner.

In the second type the endothelial cells are

arranged in definite alveoli, and this is probably the most common type of malignant tumour of the testis.

Barrett holds that there are no true alveoli, but only apparent alveoli formed by cells in blood and lymph vessels and by groups of cells separated by blood vessels.

4. That endothelioma differ clinically from carcinoma in the following points :-

(a) They generally occur in childhood or before the age of 40.

(b) They are generally of very rapid growth, but that some of the endothelioma arising from the large lymph spaces are of remarkably slow growth.

(c) They have a smooth surface. (Endothelioma of the ovary from my series of cases seem to have as a rule a very irregular surface.)

(d) The tunica albuginiea and skin are usually preserved.

(e) The cord is generally unaffected.

(f) The primary seat of the growth is usually in the epididymis.

MORTALITY

The study of these 87 cases of endotheli-oma of the ovary relative to mortality brings out some rather impressive facts. In 20 of these cases death occurred during the 1st month, but it is not stated with any accuracy in how many of these cases metastasis had occurred before operation. 36 cases are reported to have recovered, while in 31 there is no record as to their ultimate result. If the word "recovery" were to refer to the final result this would not be so bad, but it only refers to the immediate operative result, as 13 of these so-called "recovered" cases are reported to have had recurrence with a fatal termination within from 6 weeks to five

years. Thus out of 56 cases death has occurred in 33 cases, i.e. in 58.9%.

In the remaining 23 cases reported as "recovered" only a few have been recorded as having been kept under observation, and then as a rule only for a short time,- the longest period being that of Graefe's first case where the patient was well 7 years after the operation. The next longest period was that in Hubert's case, and then only for 18 months. So that one may take it for granted that the mortality is much higher than these figures would tend to show, as regards endothelioma of the ovary at any rate, though good results are recorded after surgical treatment of endothelioma in other parts of the body.

PATHOLOGY OF THE ENDOTHELIAL TUMOURS

By a neoplasm or tumour it is understood that the new growth is due to excessive cell activity and

development; and the classification of such tumour, when it does arise, depends on the histogenesis of the cell, and its morphology and arrangement.

What may be the cause of this excessive cell activity, or in other words what is the aetiology of the various new growths, either malignant or benign, to which the human subject is heir, is still, in regard to many of the malignant neoplasms at least, in the realm of obscurity. There are many and various theories held at the present moment on this subject, but they are beyond the scope of this thesis.

From an embryological point of view the ordinary endothelial cell is derived from mesoblast. The primitive mesoblast becoming differentiated into mesothelium and mesenchyme, and it is from the latter, i.e. the mesenchyme, that the endothelium of the blood vessels and lymphatics, as well as the

fibrous connective tissue and unstriped muscle tissues arise. (Beattie, Heissler, Minot, Bohme,&c. &c.)

The embryological researches of Sala and Budge go to prove that the blood vessels and lymph spaces are formed by the invagination of the mesenchyme, and the innermost lining cells of these invaginations go to form the endothelium as we now know it.

We are indebted to Von Recklinghausen for the first description of the lining cells of the lymphatic vessels and spaces, in a paper published in 1862,- probably to the less distinctive staining qualities of the cells lining the blood vessels they were not discovered or described till a slightly later period, - however it was not till 4 years later, in 1866, that he made use of the term "endothelium" in describing these cells, and he then made use of it to designate those cells lining

all body cavities not admitting air.

Ranvier extended its use to include the cells lining lung alveoli.

Eberth applied the word "perithelium" to the external endothelial-like membrane of the blood vessels of the cord and brain and the other so-called perithelial organs of which the ovary is one. This however does not refer to the perivascular lymph spaces of His, which lie just external to the perithelium.

Sala and Delamere have both shewn that the endothelium of the blood vessels and lymph spaces is practically identical with that lining the serous cavities of the body, but Minot attempts to differentiate between them by calling the lining cells of the blood vessels and lymphatics endothelium, and those of the serous cavities mesothelium; while Stohr and Szymonowisz simplify matters by calling all cells

lining blood vessels, lymphatics, serous cavities, bursal and articular cavities, "Epithelial" Cells.

Ranvier, Heiderhain, and Hamburger, in their various investigations into the functions of the endothelial cell, have discovered that it possesses the power of secreting lymph, mucin, hyaline, and amyloid substance, thus simulating rather closely the action of the epithelial cell. Then again we are indebted to Zeit and Borst among others, for the fact that this same endothelial cell is capable of producing connective tissue, granulation tissue, epitheloid cells, and intracellular cement substance.

Thus it follows that this particular cell, which gives rise to the endothelioma - of mesoblastic origin or more strictly speaking of mesenchymal origin - may behave like a connective tissue cell under certain conditions, or like an ordinary epithelial cell in others, or acquire at least some of the

functions of an epithelial cell.

Therefore it is little to be wondered at that when we are dealing with a cell of such complex possibilities, that such a cell may give rise to a tumour of very mixed characteristics, and this is well borne out by the efforts of many authors to ascribe to this particular tumour a satisfactory nomenclature.

Those who have attempted to take into account the histogenesis of the cell have made use of the following terms with respect to the tumour, - Endothelial sarcoma (Fischer and Cramer); Sarcoma Endotheliale (Rindfleisch); Sarcoma Plexiforme (Ewetzky); Alveolar Sarcoma (Billroth); Angiosarcoma (Hippel, Waldeyer and Kolaczek). It must be remembered that Sarcomata and Endotheliomata both take origin from the mesenchyme - the former probably at an earlier and more primitive stage of development - and remembering this it is not therefore surprising

that in a malignant new growth arising from endothelium, there should be in parts a reversion to the more primitive sarcomatous structure (Beattie).

Those authorities who have worked at this class of tumour, and who have taken into consideration the morphology of the cell alone, have made use of a different nomenclature, viz. Epithelioma of serous membrane (Robin); Endothelial Cancer (Shultz) ; Carcinoma endotheliale (Hansemann); Adenoma endotheliale (Hansemann).

Then we have a third set of observers who have attempted to combine both the histogenesis and morphology of the cell, and this in turn has given rise to a still more indefinite and confusing set of names, e.g. Connective Tissue Cancer (Neumann); Sarco Carcinoma (Bohme); Carcinoma Sarcomatosum (Sattler); Carcinoma Sarcomatodes Endotheliale (Hansemann).

Borst was the first to attempt the straight-

ening out of this exceedingly complex and confusing classification, when he defined the endothelial cell as a morphologically and functionally modified connective tissue cell specially differentiated as a distinct cell, and included under the name endothelial cell; those cells which line blood vessels, lymph vessels and spaces, and serous cavities; and he is supported in this description of the cell in question by Zeit.

Zeit classifies tumours under 4 heads :-

(1) Epithelial Tumours Benign and Malignant

(2) Endothelial Tumours

(3) Connective Tissue Tumours, Benign & Malignant

(4) Teratoid Tumours

And this appears to be the most simple classification one could adopt.

The origin of the tumour we now know as an endothelioma was first pointed out by Koster, who

was supported in his contention by Von Recklinghausen, while the first detailed description of such a tumour comes from the pen of Kolaczek, when he describes a series of 60 tumours arising in the walls of the blood vessels, none of them however relating to the ovary.

It is to Golgi however in 1869 that we owe the term Endothelioma, he being the first to ascribe this name to this particular form of tumour arising from endothelial cells.

From the above it will be seen that the endotheliomata resemble in many respects both the carcinomata and the sarcomata; in fact several cases have been described under the head of "Carcinoma Sarcomatosum" (Seeger), others doubtless as Sarcoma and yet others as Carcinoma. This being so, then on what grounds has one the right to place an endothelioma in a class by itself? If we take into considera:tion the points of dissimilarity between these three

forms of malignant disease, I think one is justified in placing the endotheliomata in a class by itself, and this view is held amongst others by Borst,Barrett, Zeit, Gottheil, &c. &c.

Looking at it from the dissimilarity point of view we find that an endothelioma differs from a carcinoma in the following respects :-

(1) In the age of its onset, e.g. In the first case that appears in literature - where the ovary is in question - that of Leopold,- the patient was aged 8 years; while Amann quotes a case in a child aged 7, and quite a number of cases are on record where this disease made its appearance before the age of 20.

(2) Then Endothelioma also differs from Carcinoma in the histogenesis and histology of the cell, the latter shewing in many cases typical prickle cells - a feature which is not present in the endotheliomata.

(3) There is an absence of true alveoli in the

endothelioma, the apparent alveoli appearing in tumours of this nature being due to collections of cells appearing in the blood vessels or lymph spaces; or by collections of cells separated by branches of blood vessels (Barrett).

In this connection Roberts, in his description of endothelioma of the body of the uterus, states that an endothelioma arises by a degeneration of the endothelium of the lymphatic vessels and has a distinctly alveolar structure, thus closely resembling a carcinoma. The likeness is still further marked by the fact that the proliferating cells which originally were spindle shaped become transformed into rhomboid cells, or large cells resembling squamous epithelium. In order to confirm the diagnosis a direct proof of the origin of the tumour cells from the growing endothelium of lymphatic vessels is necessary

The endotheliomata differ from the Sarcomata in the following respects :-

The character of the cell is different both in its morphology and its tendency to follow the lines of the blood or lymph spaces.

Perhaps the most distinctive feature of the endotheliomata, and the one which distinguishes it most clearly from either of the other two forms of malignant tumour is its polymorphism, which is exhibited in the arrangement of the cells and in their structure.

In one of the sections cut from my case No. I. single cells are seen distinctly outlined from the surrounding connective tissue cells and stroma.

In this particular section the cells have not taken up the stain as deeply as have cells in other sections, their shape varies, some being round andothers ovoid.

In the portion of the tumour from which the microphotograph has been taken, the cells stain well, the nuclei being very distinct.

In the endotheliomata the cells are sometimes large, often irregular in shape, and even nearly cylindrical or cuboidal, like certain forms of epithelium.

In deciding the nature of the tumour it is the peripheral portions or growing edge which affords the best indication, as is well seen in the sections taken from my Case No. II..

The fully formed part is much more difficult to discriminate, especially when degenerative changes have taken place, as in my Case No. I., as there the appearance more nearly resembles the adenomata and carcinomata. In the latter the presence of definite prickle cells is of considerable help.

It is in the growing edge that the early

phases of proliferation in the endothelium can be traced, though in older parts of the tumour, as in microphotograph from my case No. I. this feature may be seen.

The Cylindroma and Psammomata are varieties of endothelioma, the latter found in the Dura, while the former may occur in any endothelial tumour, and is distinguished by the fact of the presence of homogenous or striated cylinders of hyaline or mucoid material surrounded by layers of cuboidal or flattened cells.

Endotheliomatous tumours may be either single and nodular as in Case I., or multiple as that of the right side in my case No II.

In the earliest stages the endothelial cells of the vessels are considerably enlarged, they become thicker, more cubical or squamous in type and may finally develop into well marked multi-nucleated

giant cells. The cells at first grow amid the connective tissue bundles like a string of pearls and soon proliferate in a tubular or cone-shaped mass in all directions, so that here and there a distinctly alveolar structure can be made out.

In the later stages so rapidly do the tumour cells proliferate that the interstitial tissue completely disappears and the irregularly placed cells now assume the appearance of round celled sarcoma (Roberts).

In Endothelioma secondary changes occur as in ordinary Sarcoma.

CLASSIFICATION /

CLASSIFICATION

The Classification like most points in connection with these tumours, is somewhat confusing. Some authorities in classifying these tumours make use of three divisions; others, notably Cullen and Eckardt, make use of two divisions only; and yet others are satisfied to class all the varieties of this tumour under the common head of endothelioma.

It is to Amann in 1894 that we owe the classification now most generally adopted in connection with these interesting new growths. He described three varieties according to the origin of the tumour cells.

I. Perithelioma. Where the condition arose from the lymphatics round the blood vessels.

II. Endothelioma Intravasculare. Where the condition arose from the endothelium of the blood vessels themselves.

III. Endothelioma Lymphaticum. Where the condition arose from the endothelium of the Lymphatic vessels and spaces.

Barrett makes use of the more high-sounding titles :-

I. Haemangio Endothelioma Perivasculare.

II. Haemangio Endothelioma Intravasculare.

III. Lymphangio Endothelioma Intravasculare.

to express exactly the same conditions.

Roberts describes two groups:

A. Perithelioma

B. Endothelioma

and he subdivides the Endotheliomata into two groups:

(a) Endothelioma Vasculare

(b) Endothelioma Lymphaticum.

This want of unanimity in the classification has made it impossible to give statistics of the whole of this series of 87 cases, but sufficient

data is at hand to prove that the Endothelioma Lymphaticum is by far the most common variety as far as the ovary is concerned, and this also holds true for the Testis. I find a definite classification has been arrived at in 62 of the 87 cases, and of these 62 cases 43 have been classified as having arisen from the lymphatic system, giving a percentage of 69.3 in favour of Endothelioma Lymphaticum.

On the other hand 13 of the cases have been shewn to arise from the small Lymphatics round the blood vessels, this shewing a percentage of 20.9 of Endothelioma Perivasculare.

The third variety, that arising from the blood vessels direct, seems to be by far the most rare, -only 6 having been recorded, - giving a percentage of 9.6 as the frequency of Endothelioma Intravasculare.

Thus it will be seen that the order of

frequency of the varieties in this sequence of cases is as follows :-

1. Endothelioma Lymphaticum 69.3%

2. Endothelioma Perivasculare 20.9%

3. Endothelioma Intravasculare 9.6%

Endothelioma may occur in other parts of the female generative organs besides the ovary, but the ovary appears to be by far the most common of the reproductive organs to be affected.

Cullen in his book on "Cancer of the Uterus" speaks of six cases of Endothelioma of the Cervix and regards it as a very rare condition.

Kelly in his Text Book on "Operative Gynaecology" also refers to six cases; while Barbour in his paper on "Endothelioma of the Ovary" quotes eleven cases in which the cervix was the seat of this disease.

It has been described in the body of the Uterus, quite recently, by Phillips, Backhaus and Silberberg, and an interesting point in the former two cases is that it apparently arose in a myomatous condition of that organ.

Jellett reports a case of primary Endothelioma of the Vagina.

In this case Dr Jellett excised both Uterus and Vagina, and on communicating with him, he informs me that his patient is quite free from any signs of recurrence, eleven months after the operation.

Braetz and Schmidlechner each report a case of Endothelioma of the vulva.

Any other part of the body may be attacked by this affection, but the commonest sites appear to be the Skin, Testis, Parotid and Submaxillary Glands, the neighbourhood of the mouth and cheeks, the long bones, and the so-called carotid gland. Cases

involving all these structures have been the subject of recent comment. (Carless).

CONCLUSIONS

The Conclusions that one may arrive at in studying this series of cases is as follows :-

I. That the Endotheliomata do not conform in all particulars to either the Sarcoma or the Carcinoma and that therefore they should be considered as a separate and definite tumour to be placed in a class by themselves. This classification is justified by the Histogenesis, Morphology and arrangement of their cells.

2. That the Endotheliomata should - in order to avoid the present confusion - be divided into three distinct varieties to correspond with their three origins, as suggested by Amann; rather than into two as suggested by Cullen and Eckardt.

3. That the Ovary is the most common of the reproductive organs to be affected by this disease and that the most common variety is that which arises from the Endothelium of the Lymphatics.

4. That the longer the operation is delayed the greater the mortality.

5. That Metastasis is comparatively speaking a common occurrence.

6. That this is a much more rapid growing tumour - when the Ovary is concerned - that it is generally given credit for.

7. That owing to the tendency of the opposite Ovary to become affected, when one ovary has been diagnosed as the seat of malignant disease, the other ovary should always be removed as a prophylactic measure; and that unless there is some strong contra indication, the Uterus should be extirpated at the same time.

8. That in all cases where an ovarian tumour has been removed, and where there is the slightest suspicion of malignant trouble, the condition should become the subject of careful pathological examination.

9. That this condition has not received as much attention as its importance warrants, at the hands of English and American pathologists.

10. Finally the importance of educating the female portion of the general public to at once seek advice concerning any pelvic trouble, no matter how trivial it may appear.

SHORT PRECIS OF THE VARIOUS RECORDED CASES

1874. Leopold. "Lymphangioma Cystomatosum".

Age of patient, 8 years

Autopsy on child who died from Marasmus, when a tumour weighing 16 lbs. and measuring 36 x 26 x 19 cm. was discovered. Leopold accounts for the lightness of the tumour by the fact that it had undergone considerable cystic degeneration.

On microscopic examination it was found that the connective tissue contained numerous fine fissures lined with endothelial cells, and that the endothelium had proliferated in many places into bud-like growths, and that the walls of the cyst were perforated in several places by the proliferation of the connective tissue and endothelium. Leopold considers that the proliferation of the connective tissue was due to tortion of the pedicle of the tumour and that the endothelium was derived from the Lymphatics.

1879. Marchand (2 cases)

Case I. "Endothelioma Lymphaticum"

Age of patient, 48 years

Both Ovaries were found to be the seat of disease and were removed together with a metastatic

tumour as large as a hazelnut adhering to the fimbriated extremity of a tube. This patient recovered from the operation but died 2 years later of disease of the spinal cord which was doubtless due to metastatic growth.

Of the two tumours one was solid, the size of a cricket ball, the larger cystic and the size of an adult head.

Microscopically the connective tissue shewed numerous fissures lined with endothelial cells. The endothelium was proliferating and formed masses of cell groups which in form resembled carcinoma cones. The stroma shewed myxomatous degeneration, the cells themselves shewing much hyaline degeneration.

The expansion of the Lymph Spaces gave rise to formation of many small cysts.

Case II. "Endothelioma Tubulose"

Age of patient, 60 years

Tumour found in a conjenital inguinal Hernia. Size of tumour, 14 x 10 x 9 cm.

Microscopically: The tumour shewed tubes of endothelial cells. These tubes were intermingled with connective tissue, which formed a tunic round the spiral cell cylinders. Hyaline degeneration was

also a marked characteristic of this tumour.

An interesting point in this particular case being the fact that the tumour was found lying in the sac of an Inguinal Hernia, as the condition of Hernia of the ovary is comparatively rare,- only about 400 cases being on record.

1882

Ackermann. Endothelioma Intravasculare

Age, not stated

Microscopically: The walls of the tumour were practically formed of capillaries, but they contained no blood corpuscles, being either empty or plugged with round cells. The spaces between the capillaries were nearly all empty, but occasionally they contained cell elements or an albumenous substance. The cells in the vicinity of the outside walls of the blood vessels were more spindle shaped than round. The condition in this case was unilateral, the other ovary being normal in size and shape and apparently healthy, but metastasis had occurred in the retroperitoneal glands.

Flaischlen. Endothelioma Lymphaticum

Age, 37 years

Macroscopically: Left-sided tumour, size

of child's head, very hard and very adherent.

The upper half of the tumour was covered thickly with a papillary growth, the other half being covered by peritoneum.

On Section: The tumour was seen to consist of two cysts containing a thin fluid and separated by a thick dividing wall. In the larger of the two cysts was found a daughter cyst about the size of a bantam's egg.

Microscopically: The tumour cells were considered to have their origin from the endothelium lining the Lymph Spaces.

The condition was uni-lateral.

1886

Olshausen. Endothelioma Intravasculare.

Age, 17 years

Macroscopically: The tumour was the size of an adult head; densely adherent to surrounding structures and only removed after death of patient some 9 days later.

Microscopically: The tumour consisted of a net-work of Capillaries which were either empty or filled with round cells and spindle-shaped cells. The surrounding spaces were either empty or filled

with an albumenous looking substance.

The Condition was uni-lateral.

Metastasis had occurred in the Liver and the Retroperitoneal Glands.

1889

Eckardt. Endothelioma Intravasculare.

Age, 46 years

Macroscopically: Large left-sided tumour. Weight 4200 grams. Solid in consistence and freely moveable.

Microscopic findings not stated.

The condition was uni-lateral.

1890

Pomorski. Case I. Endothelioma Lymphaticum.

Age, 8 years

Macroscopically: Tumour the size of an adult head, weighed 10 lbs. The surface was glistening; with knotty outgrowths.

On Section: It was found to consist of a reticular stroma in which appeared a number of large and small cysts, some being filled with a clear fluid, others containing a dark fluid.

Microscopically: A number of various sized and shaped Tubules could be demonstrated, which contained a soft membrane composed of spindle cells and surrounded by a single layer of cylindrical epithelium. The larger tubules shew a distinct cavity which is filled with broken down material or cells, these latter having a clearly defined small nucleus. The Connective Tissue of the Stroma consists of long bundles of fibres, and between these bundles are fissures having a single layer of endothelium which is undergoing rapid growth and throwing out shoots which in turn filled and widened the Lymph Spaces.

The Condition was uni-lateral.

Case II. Endothelioma Lymphaticum.

Age, 49 years

Macroscopically: A compact elastic tumour. On right side of surface of tumour hard nodules were perceptible.

Microscopically: The microscopic findings are not stated but taking into consideration the lucid description of this author's previous case I think one is quite justified in numbering this case as amongst the Endotheliomata.

Condition was uni-lateral.

Metastasis had occurred on the small intestine.

VELITS. Endothelioma Lymphaticum

Age, 24 years

Macroscopically: Size of an adult head. Left Ovary affected. The surface was smooth and glistening, and shewed the presence of some white, dough-like protuberances varying in size from a walnut to a fist.

Microscopically: The tumour shewed myxomatous cystic degeneration, but was very different from the glandular cyst of the ovary. It had rather the peculiar characteristics of Angiosarcoma and was plainly a growth from the lymphatic vessels.

The Condition was uni-lateral.

An interesting point about this case being the slowness of its growth. The patient being aware of a tumour in her left side which had gradually been growing and increasing in size for 9 years previous to operation.

1891

ROSTHORN: Endothelioma Perivasculare

Age, 48 years

Macroscopically: The tumour looks like an ordinary Ovary which is very much enlarged.

Microscopically: The tumour is seen to

consist of a thick fibrous ground-work, enclosing many alveolar cavities, which are separated from the surrounding connective tissue by a sharply defined line. These cavities are filled closely with cuboid shaped epithelial cells, not very large and containing very little protoplasm.

Amongst these masses of cells were lacunar cavities, some of which contained healthy blood corpuscles, others masses of broken down material. There were also round spaces in the middle of the alveoli, whose structural contents were probably a degenerate product of the cells.

The tumour consequently represents an endothelioma arising from the so-called perithelium of the blood vessels.

The Condition was uni-lateral.

1892

Müller. Endothelioma Cysticum

Age Not stated.

Macroscopically: The tumour was the size of a child's head and composed chiefly of a multilocular cyst. The external surface was for the most part smooth, with an occasional rough rugged patch shewing the remains of old adhesions.

On Section: The Cyst consisted of one principal chamber and many secondary ones.

Microscopically: The wall of the principal chamber shewed a structure devoid of lamellae.

In the thin parts of the wall of the Cyst were found many cavities and fissures lined with epithelial cells.

The thick parts of the walls were formed of thick fibrous connective tissue with epithelial elements.

This is a somewhat doubtful case but in all probability it may be considered as an endothelioma of the cyst wall.

The condition was uni-lateral.

1894.

AMANN. Case I. Endothelioma Perivasculare.

Age, 29 years

Macroscopically: The tumour was the size of a man's fist, circular in form and hard in consistence, shewing some shaggy patches on its surface due to recent adhesions.

Microscopically: Under high power the neoplastic cells could be defined as mostly circular or oval in shape lying close together without perceptible intracellular substance. The Nuclei of

the cells were unusually large and practically filled the body of the cell.

The condition was uni-lateral.

Case II. Endothelioma Lymphaticum.

Age, 64 years

Macroscopically: A tumour of both ovaries, the surfaces of which shewed the presence of many adhesions.

On Section: The tumours shewed the presence of many cysts of all sizes, some of which contained a serous fluid, others a dark fluid, evidently degenerated blood. The walls were seen to be very much thicker than those found in an ordinary Ovarian Cystoma.

Microscopically: Microscopic examination of the outer coverings of these cysts shewed them to contain layers of oval, almost spindle-shaped cells, diminishing in size at the border of the Lumen. From here radiated columns of cells in all directions which even passed into the spongy structure. These structures consisted of a convolution of crossing and re-crossing cell columns, which were formed of round or polygonal cells. This arrangement of the columns in the structural tissue giving rise to the supposition that they have usurped the Lymphatic Spaces.

The condition was bi-lateral.

Case III. Endothelioma Intravasculare.

Age, 48 years

Macroscopically: A tumour of both ovaries, each about the size of a child's head and each weighing 870 grams. These were solid and hard in consistence, and

On Section were seen to be composed of a spongy soft mass.

Microscopically. In a strong, prolific, connective tissue stroma, columns of cells were embedded which formed central cavities. The cells were so arranged that they appeared to radiate from a common centre.

Fine tubes were also perceptible, one side of which shewed normal endothelium, while on the oth: :er side multitudinous spindle cells were heaped.

From the contents of the tubes it can be seen that the proliferation arose from the Endothelium of the Capillaries.

The condition was bi-lateral.

Case IV. Endothelioma Intravasculare.

Age, 25 years

Macroscopically: The tumour was in size about that of a hen's egg. It was solid and on section seen to consist of a soft red mass.

Microscopically: Microscopic investigation shewed the Stroma to be strongly infiltrated, to such an extent that it was difficult to discover the alveolar position of the neoplastic cell masses. The Endothelium of the capillaries was in active proliferation, but no connection could be shewn between them and the neoplastic cells: but everything pointed to the probability of the tumour being an Endothelioma Intravasculare.

The Condition was uni-lateral.

An interesting point in this case being that the tumour was found to be lying in the sac of an Inguinal Hernia.

Case V. Endothelioma Lymphaticum.

Age, 7 years.

Macroscopically: The tumour was of "Gigan tic proportions" and was very soft in consistence. On Section: It was found to contain many cysts fill :ed with a watery fluid and between the cyst walls was collected a large quantity of blood.

Microscopically: It was shewn to consist mostly of masses of spindle and giant cells in tubul :ar form.

Endothelium was nowhere found, but as the arrangement of the cells resembled the course of the

Lymphatics the above diagnosis was arrived at, and this was upheld by finding Leucocytes in the interstices of the tubes.

The condition was uni-lateral.

Metastasis had occurred in various directions.

CULLEN. Endothelioma Perivasculare.

Age, 48 years

Macroscopically: Tumour growing from left ovary, size not stated. The surface shewed the presence of numerous adhesions. On section the tumour shews coagulation necrosis. The microscopic findings are not stated. Cullen first calls the condition an Angiosarcoma but qualifies this by saying it is a rare condition and usually spoken of as an endothelioma. And he goes on to speak of two sources of endothelioma, viz. those from blood vessels, and those from lymph spaces; therefore I think one is justified in considering this case amongst the endotheliomata.

The condition was uni-lateral.

Metastasis had occurred on the uterus.

PICK. Case I. Endothelioma Lymphaticum

Age, 48 years

Macroscopically: Left-sided ovarian

tumour, size of a child's head, and a smaller right-sided tumour. The Tumours were solid and on section shewed a yellowish white appearance.

Microscopically: The tumours shewed a fibrous stroma and that of the left side shewed a complete absence of normal ovarian tissue. Columns of sharply defined cells were noticed, with oblique fissures towards their ends. They were partially covered with endothelium which in certain places was undergoing proliferation. The blood vessels contained normal endothelium and were surrounded by more or less perfect neoplastic cells. The examination shewed the lymph spaces to be the starting point of the new growth, hence the classification.

The condition was bi-lateral.

Metastasis had occurred on to the peritoneum.

Case II. Endothelioma Lymphaticum.

Age, 26 years.

Macroscopically: Left-sided ovarian tumour size of an adult head, with a shaggy surface, due to adhesions.

Microscopically: Under the microscope the tumour is seen to possess a fine fibrous stroma containing chains of cuboid or round cells arranged in parallels and having well coloured nuclei. There

was marked proliferation of the endothelium of the lymph spaces.

The condition was uni-lateral.

VOIGT. Endothelioma Lymphaticum.
Age, 16 years

Macroscopically: Left-sided tumour, size of a man's head. The surface was almost entirely covered with adhesions. On section it shewed a fibrous capsule with fibrous trabeculae running towards the centre.

Microscopically: Cells having their origin from the endothelium of the lymph vessels were seen, hence the diagnosis.

The tumour also shewed the presence of a considerable amount of Hyaline degeneration.

The condition was uni-lateral.

1896

FABRICIUS. Endothelioma Lymphaticum.
Age, 40 years.

Macroscopically. Right-sided tumour of ovary, about size of hen's egg, shewing presence of some adhesions.

Microscopically. The capsule of the

tumour shews Hyaline degeneration. Lying in the capsule may be seen a number of minute fissures containing endothelium which is encroaching on the large polygonal cells. Some of these fissures shew a disposition to spread and are filled with one or more rows of neoplastic cells.

The condition was uni-lateral.

KÖTSCHAU. Endothelioma Lymphaticum.

Age, 54 years.

Macroscopically. Tumours of both ovaries; that of the right side being the size of a child's head, while that of the left being the size of an adult head. On section the tumours were seen to consist of numerous cysts which contained quantities of broken down material.

Microscopically. Under the microscope the connective tissue was seen to be undergoing degeneration and to contain epitheloid cells. The epithelium of the lymphatic tract was also seen to be undergoing proliferation. No blood corpuscles or their remains could be seen anywhere.

The condition was bi-lateral.

RIBBERT. Case I. Endothelioma Lymphaticum.

Age, 21 years.

Macroscopically: Double ovarian tumours . That on the right side being about size of a duck's egg, while that on the left side was the size of an adult head. The tumours were hard and solid, with an uneven surface and shewed the presence of many dense adhesions, that of the right side being so closely adherent to the intestine that a portion of the gut had to be cut away before the tumour could be removed.

Microscopically: The tumours were seen to consist of a well-marked connective tissue stroma in which were imbedded narrow rows of cells.

The free connective tissue shewed nowhere any endothelial covering.

Numerous small united lymph vessels could be seen in whose walls narrow endothelial cells could be seen in the process of proliferation. In isolated spots in the tumours where the cells were thickly imbedded, leucocytes could be seen lying amongst these cells.

The condition was bi-lateral.

Case II. Endothelioma Lymphaticum

Age, 29 years

Macroscopically: Tumours of both ovaries. The left-sided tumour being much the larger of the two, somewhat flat in shape, and having a knobby surface. The right-sided tumour was very hard and about the size of an apple.

Microscopically: In the peripheral zone, which was 3 cm. wide, could be seen dark coloured patches, and on careful examination these dark patches were seen to contain groups of cells which were diffusely imbedded in the connective tissue stroma. Besides these cells there were other small isolated groups with sharply defined boundaries, lying partly in the lymph spaces, whose endothelium was distinctly visible, and partly in oblique fissures containing neoplastic cells.

The condition was bi-lateral.

ROSINSKI. Case I. Endothelioma Lymphaticum.

Age, 41 years

Macroscopically: Double ovarian tumours. Both tumours the size of a child's head with irregular outlines and semi-solid in consistency.

On Section: They were seen to be chiefly composed of numerous thick walled cysts.

Microscopically: It was seen that the tissue forming the tumours was partly fibrous and partly sarcomatous, containing fissures which were filled with both normal and abnormal endothelial cells Large cystic looking alveoli were formed by the small cells. The stroma and parenchryma were seen to be undergoing Hyaline degeneration.

The condition was bi-lateral.

Case II. Endothelioma Lymphaticum.

Age, 55 years.

Macroscopically: Right-sided ovarian tumour, size of an adult head or somewhat larger, the surface being distinctly irregular with here and there rugged patches, due to adhesions.

On Section the tumour was seen to consist of a multitude of cysts with here and there soft patches lying between them.

Microscopically: On microscopic examination masses of cells were found lying in the stroma, with distinct alveolar cavities which were lined with endothelium.

The condition was uni-lateral.

Case III. Endothelioma Lymphaticum.

Age, 39 years.

Macroscopically: Right-sided tumour, size of a man's head, with a smaller one growing from it. The tumour was solid and of soft consistence, with a distinctly irregular outline.

Microscopically: Under the microscope numerous lymph vessels could be seen whose endothelium was undergoing active proliferation. The primary tissue consisted of a myxomatous stroma, in which lay alveolar groups of epitheloid cells.

The condition was uni-lateral.

ZANGEMEISTER. Angiosarcoma.

Age, 32 years.

Macroscopically: Right-sided ovarian tumour, size of a child's head, hard and solid, surface covered with recent adhesions.

On Section: The centre of the tumour was broken down with result that cavity formation was starting. The capsule was perforated in several places.

Microscopically: No particulars are given beyond the statement that Arnold gives the diagnosis "Angiosarcoma of right ovary with progressive necrosis"

This under the circumstances must be regarded as a doubtful case of endothelioma, but taking into consideration the fact that Waldeyer, Kolaczek, and Hippel have all made use of this term in connection with endothelioma, perhaps one may be justified in including this case among the series.

The condition was uni-lateral.

FRÄNKEL. Case I. Endothelioma Lymphaticum.
Age, 24 years

Macroscopically: Right-sided ovarian tumour, weighing 820 gr. The surface was knotty and covered with numerous transparent cysts, while there was evidence of numerous adhesions. On section the tumour was found to consist of one large cyst with many small cavities about the size of a walnut growing from it. The contents of the cyst was a clear yellow fluid containing many cholesterin crystals.

Microscopically: On microscopic examination it was seen that the glandular cavity with its numerous outgrowths was surrounded by flat endothelium without any visible cell boundaries.

The condition was uni-lateral.

Case II. Endothelioma Lymphaticum.

Age, 29 years.

Macroscopically: The tumour was the size of a child's head, but from which ovary it arose is not stated. The surface was covered with numerous hollow spaces of a whitish colour. On section it was seen that the tumour consisted of a large number of smooth walled cysts containing a clear serous fluid , which contained a large number of cholesterin crystals.

Microscopically: It was found that the cyst walls were covered with flat endothelium, and that the boundaries of these cells could not be well made out.

The condition was uni-lateral.

Case III. Endothelioma Lymphaticum.

Age, 51 years.

Macroscopically: This tumour was the size of a man's fist, but from which side it arose is not stated. On section it was found to consist of one large cyst and several smaller ones with hard walls which contained deposits of lime salts.

Microscopically: It was seen that in some

places the covering of the cyst walls had been turned into endothelium.

The condition was uni-lateral.

POLLAK. Endothelioma Perivasculare.

Age, 41 years

Macroscopically: This was a left-sided ovarian tumour, considerably larger than a man's head. It was perforated before removal and 10 liters of clear serous fluid drawn off.

On Section: It was seen that the tumour was a multilocular cyst, and there was evidence that some of the divisions between the cysts had broken down and floating portions of connective tissue could be seen.

Microscopically: The lumen of the capillaries shewed nothing remarkable, the small endothelial cells were intact.

The condition was uni-lateral.

TROVATI. Endothelioma Lymphaticum.

Age, 28 years.

Macroscopically: Left-sided ovarian tumour. Owing to the very dense adhesions only a portion of the tumour could be removed at time of operation.

P.M. It was found that the tumour was the size of an adult head; it was somewhat spherical in shape and had a distinct constricting band dividing it into two lobes.

On Section it was seen to consist of two cysts, one somewhat larger than the other. The walls of the cysts were found to be generally thickened, the lower portion of the wall being evidently the seat of a neoplasm, while the surface of the tumour was covered with dense adhesions.

The Right Ovary was also the seat of a new growth and enlarged to the size of a man's fist.

Microscopically: It was seen that the lymph vessels and lymph spaces running in the connective tissue were filled with polymorphous epithel: :oid cells.

The condition was bi-lateral.

1899.

BURCKHARD. Case I. Endothelioma Lymphaticum. Age, 55 years.

Macroscopically: Tumour the size of a man's head, but from which ovary it was growing is not stated. The surface shewed the presence of numerous adhesions.

On Section it was seen that the tumour had undergone marked cystic degeneration.

Microscopically: It was demonstrated that the tumour consisted of numerous round or alveolar cavities containing spongy light-coloured masses, and covered with flat endothelial cells. Here and there were seen the transition of the

Metastasis had occurred.

The condition was uni-lateral.

Case II. Endothelioma (Variety not stated)
Age, 54 years.

Macroscopically: The tumour was considerably larger than a man's head and weighed 13 kilograms but from which side it was growing is not stated.

On Section it was seen that marked cystic degeneration had occurred and about 10 liters of clear fluid escaped.

Microscopically: On microscopic examination it was seen that the tumour was composed of numerous cysts closely packed together with very narrow septa. These cysts contained a quantity of broken down material and were covered with endothelium. Some of the cysts were changed into fissure shaped cavities covered with endothelium.

The condition was uni-lateral.

Case III. Endothelioma (Variety not stated)
Age 63 years.

Macroscopically: A compound tumour the size of an adult head, but from which side it arose is not stated. On section the tumour was seen to be composed of numerous cysts, some of them containing blood coloured fluid, others clear fluid. There were also here and there a number of firm nodules of a whitish appearance. These nodules were mostly on the upper surface and were about the size of an apple.

The Microscopic characters in this case are not given and therefore one must be inclined to class it amongst the doubtful cases, but taking into consideration the careful way this author has studied the pathology of the condition in his previous two cases, I think one is justified in including this one among the series of endotheliomata of the ovary.

HERZ. Endothelioma Lymphaticum.
Age 14 years.

Macroscopically: Tumour the size of an adult head of the left ovary, shewing a glistening surface with here and there a shaggy patch due to adhesions.

On Section: The tumour was seen to be

practically solid with the exception of a small cavity the size of a walnut which contained thin mucous fluid, and of a grey colour.

Microscopically: Numerous fissures are seen lying in the external portions of the tumour and these fissures are seen to be filled with endothelial cells undergoing proliferation, and seem to be rising from that lining the lymph spaces.

The condition was uni-lateral.

HENROTIN & HERZOG. Endothelioma. Variety not stated Age, 30 years.

Macroscopically: Right-sided ovarian tumour the size of a child's head, spherical in shape, and varying from greyish white to pink in colour.

Microscopically: No epithelial covering cells could be found. The tumour itself consisted of a stroma of spindle cells very like normal ovarian tissue cells and between these cells were seen other medium sized round or cuboid cells with large nuclei rich in finely granular chromatin.

The condition was uni-lateral.

KRUKENBURG. Endothelioma Perivasculare.

Age, not stated

Macroscopically: A large tumour weighing 4480 gm. but from which ovary it arose is not stated.

Microscopically: The microscopic examination shewed that the capsule was formed of thick fibres which contained innumerable cavities, all of which were empty and possessed a well-defined endothelial lining. The first stages of the neoplastic growth were in the form of short rows and cords of cells which seemed to have no connection with the endothelium of the cavities. These cells were round or polygonal and contained well marked nuclei.

The condition was uni-lateral.

MIRABEAU. Endothelioma Perivasculare.

Age, 62 years.

Macroscopically: Tumour the size of a man's head, but from which side it arose is not stated. It had ruptured previous to operation and at the time of operating it was found impossible to remove it owing to dense adhesions.

P.M.: It was found that the surface of the cyst was covered with knotty outgrowths of the colour

and consistence of brain matter.

Microscopically: A much degenerated stroma was seen containing numerous groups of polymorphous cells always containing a blood vessel in their centre.

The Endothelium of the vessels was intact, the tunicae media and adventitia were undergoing hyaline degeneration, from the tunicae were radiating cells, which grew less and less the further they receded from the endothelium.

The condition was uni-lateral.

1900

BROUHA. Endothelioma. (Variety not stated)
Age, 46 years

Macroscopically: A dermoid tumour was combined with this tumour of the ovary, but from which side it arose is not stated.

Microscopically: Marked degeneration of the endothelium of the blood vessels and lymphatic spaces could be demonstrated.

The condition was uni-lateral.

HUBERT. Case I. Endothelioma Lymphaticum.
Age, 11 years

Tumour removed from right ovary, but no

pathological report can be found of either of his two cases.

Case II. Endothelioma Lymp haticum

Age, 40 years

LINCK. Endothelioma Lymphaticum.

Age, 50 years.

Macroscopically: Double ovarian tumours. Right tumour the size of a child's head. Left tumour somewhat smaller. The surface of the right tumour was irregular and contained numerous cysts. That of the left was also irregular but consistence was solid.

Microscopically: The capsule was seen to consist of thick connective tissue. The tumour shewed numerous small cysts partly filled with cells of various shapes, some being flat, others round and yet others cuboid, and partly surrounded with cylindrical epithelium. Here and there in the connective tissue were lymph fissures having diverticulae which was surrounded with endothelium.

The condition was bi-lateral.

1901

APELT. Endothelioma Lymphaticum

Age, 33 years.

Macroscopically: Right-sided ovarian tumour, size of a man's head. The surface was for the most part smooth and glistening but shewed the presence in places of adhesions.

On Section: The capsule was thick and the tumour was seen to be solid in consistence, and at one spot the capsule could be seen to be perforated.

Microscopically: It was found that the capsule was infiltrated with small cells. The tumour was clearly seen to be formed by the proliferation of the endothelium of the lymphatics.

The condition was uni-lateral.

BRUCKNER. Case I. Endothelioma Lymphaticum.
Age, 24 years

Macroscopically: Left-sided ovarian tumour the size of an adult head, and shewing presence of many adhesions.

On Section: It was seen that the tumour was somewhat spongy in consistence, containing numerous small cysts filled with mucous fluid.

Microscopically: On microscopic examination it was demonstrated that the tumour was composed of cell cords, irregular in shape, with lateral off-

shoots, changed occasionally into small cysts.

The condition was uni-lateral.

Case II. Endothelioma (Variety note stated)
Age, 44 years

Macroscopically: Left-sided tumour the size of a foetal head. The right ovary was small but very irregularly lobed. The tumour was enclosed in a fine capsule, intact and lustrous and looked like peritoneum.

On Section: Numerous small vasicular ridges could be seen lying immediately beneath the capsule.

Microscopically: The Capsule was seen to be covered with endothelium.

Metastasis had occurred affecting the uterus.

The condition was bi-lateral.

GUFFROY. Endothelioma Lymphaticum.
Age, 52 years.

Macroscopically: The tumour is the size of a small head but from which side it arose is not stated. It consists of a cyst with a smooth surface shewing here and there rugged patches due to

adhesions.

Microscopically: Under the microscope it is clearly seen that the covering consists of endothelium. The endothelial cells are much swollen and vary in size and shape. Often many layers were seen rising irregularly over each other so that the lumen of the fissures was nearly filled with them.

The condition was uni-lateral.

HAAKE. Endothelioma Lymphaticum.

Age, 31 years.

Macroscopically: Large compound tumour of the right ovary reaching as high as the costal margin.

Microscopically: Under microscope this tumour has the structure of both a sarcoma and a carcinoma. Its origin from the endothelium of the lymphatics is clearly seen. In some places there were masses of clear well defined cells enclosed in dark coloured masses of Syncytium. Syncytial groups lay also free in the blood spaces.

The condition was uni-lateral.

LANGER. Endothelioma (Variety not stated)

Age, 50 years

Macroscopically: The right ovary is somewhat enlarged and consists of reddish white masses of knots.

Microscopically: In a distended sarcomatous stroma were fissures of various sizes, in the larger of which were found smooth cells. In the lumen were complex sarcomatous cells. Spaces were noticed in which knotty growths from the stroma intruded, which at the terminus usually held a group of sarcomatous cells. All inferences pointing to the tumour as an endothelioma.

The condition was uni-lateral.

An interesting point in this case was the presence of a myoma of the uterus.

WIEDERSHEIM. Endothelioma Lymphaticum.

Age, 40 years.

Macroscopically: Left-sided tumour the size of a goose egg, with a hard and rough surface.

On Section: The growth was seen to be partially solid and partially cystic, with large intervening cavities.

Microscopically: It was seen that the tumour had its origin in the endothelium of the lymphatics; particularly the transformation of this endothelium of the lymph glands into the sarcoma tissue.

1902

ABADIE. Endothelioma (Variety not stated)
Age, 36 years.

Macroscopically: Double ovarian tumours. The size and weight or shape are not stated. The left was soft and somewhat fluctuating to the feel, while the right was more solid and resistant.

Microscopically: No trace of the original ovarian tissue could be found. The microscopic appearance of the tumour seems to indicate the sarcoma but it is also in favour of the Endothelioma.

The condition was bi-lateral.

Metastasis had occurred affecting the peritomeum.

FRANQUE. Endothelioma. (Variety not stated)
Age, 51 years

Macroscopically: Left-sided ovarian tumour; consistence partially cystic and partially solid. The tumour was very brittle, and owing to the dense adhesions could only be removed in portions, so that it was impossible to make a correct estimate of its size, though it was very large, with a very irregular surface.

No microscopic findings are described so that one cannot but consider this a doubtful case.

The condition was uni-lateral.

Metastasis had occurred involving the peritoneum.

GODART. Endothelioma Lymphaticum.

Age, 47 years

Macroscopically: Double ovarian tumours; the left being the size of a cocoanut and the right somewhat smaller, about the size of a man's fist. The tumours were somewhat soft and elastic in consistency.

Microscopically: Microscopic examination shews the tumours to be of connective tissue, having their origin in the endothelium of the lymphatics which has undergone marked proliferation.

The condition was bi-lateral.

JONNESCO. Endothelioma Perivasculare.

Age, not stated.

Macroscopically: Double ovarian tumours the size of an orange. Very hard to the feel and shewing irregular surfaces.

Microscopically: Microscopic examination of the tumours shew them to be clearly perithelomata.

The condition was bi-lateral

Metastasis had occurred affecting the omentum, tubes, peritoneum &c.

SOUBEYRAN. Endothelioma (Variety not stated)

Age, 48 years

Macroscopically: Large left-sided ovarian tumour with numerous knobby projections on its surface and a short pedicle. The tumour was oval in shape and about the size of a child's head. The surface was studded with large irregular lobes, and these lobes were hard in consistence. On section some of these lobes were found to contain a clear liquid, and they were enveloped in a tough resistant capsule; while the tumour tissue was compact and firm.

No definite microscopic findings are described.

The condition was uni-lateral.

STAUDER. Case I. Endothelioma Lymphaticum.

Age, 39 years.

Macroscopically: Double ovarian tumours, the right being the larger of the two, about the size of a fist; the left being somewhat smaller. Both tumours had an irregular knotty surface and were hard in consistence.

Microscopically: The normal ovarian tissue was entirely absent. In a connective tissue stroma whose beams were of varying thickness, ran darkly coloured cell fibres which were probably an effusion of the lymphatic system. In numerous places the cells of the tumour were undergoing myxomatous degeneration, and as this progressed the typical structure of the tumour disappeared.

The condition was bi-lateral.

Metastasis had occurred affecting the peritoneum and liver.

Case II. Endothelioma (Variety not stated)
Age, 55 years

No macroscopic description given.
Microscopic diagnosis: Endothelioma
Metastasis had occurred.

Case III. Endothelioma Lymphaticum.
Age, 37 years

Macroscopically: Right-sided ovarian tumour, size of a child's head. The surface was covered with small nodules the size of a bean, and on section the tumour was seen to be partially solid and partially cystic. The cyst contained a thin

yellowish fluid mixed with blood.

Microscopically: Only a few portions of the tumour have a real alveolar construction. Most of them are round and spindle celled tumour masses, not united in large groups, but lying in single rows between the fibres of the connective tissue of the stroma. In many places the tumour cells are so dispersed in the interstitial tissue that it resembles a sarcoma with fibrous intercellular substance.

The condition was uni-lateral.

Metastasis had occurred affecting the peritoneum.

Case IV. Endothelioma Ovarii Cysticum.

Age, 63 years

Macroscopically: Double ovarian tumours.

No description of the microscopic findings.

The condition was bi-lateral.

Case V. Endothelioma Ovarii Cysticum.

Age, 54 years

Microscopic diagnosis as above.

Case VI. Endothelioma Perivasculare.

Age, 53 years

Macroscopically: A colossal tumour which weighed no less than 93 lbs.

Microscopic diagnosis as above.

Although of this author's series of 6 cases he only gives a detailed description of two of them, that description is so complete that I think one is justified in accepting his diagnosis in the other 4 cases.

1903

LANGE. Endothelioma. (Variety not stated)
Age, 41 years

Macroscopically: Left-sided ovarian cyst. The right ovary was enlarged to twice its normal size.

Microscopically: On microscopic examination it was clearly seen that the right ovary was the seat of a new growth of the nature of an endothelioma, as were also numerous metastatic growths in the peritoneum.

The interesting point about this case being that the left ovary had been removed 5 months previously for what was at the time supposed to be an ordinary ovarian cyst. The patient returned 5 months later suffering from pleuritic effusion, which in spite of repeated tappings carried her off rapidly, and it was only on P.M. examination that the right

ovary was found to be affected and that general metastasis had occurred.

The condition was evidently bi-lateral.

Metastasis had occurred affecting the peritoneum, lungs, broad ligaments, &c.

LINCOLN. Endothelioma. (Variety not stated) Age, not stated.

Macroscopically: Right-sided ovarian tumour with a fairly firm consistence. On section it looked like a papillomatous cyst containing broken down debris, and the interior of the tumour was very friable.

Microscopically: The interior of the tumour was made up of masses of small cells whose nuclei practically filled the cell body. These cells were in places arranged in such a way as to suggest an attempt at the formation of tubules or vessels. The cells were packed together without any apparent intervening structure, but did not form alveoli, as in carcinoma. Numerous small vessels could be seen lying amid the cells, the walls of which appeared to be formed of the cells themselves.

The condition was uni-lateral.

SCHURMANN. Endothelioma Lymphaticum.

Age, 27 years

Macroscopically: Right-sided ovarian tumour the size of a child's head, shewing presence of numerous adhesions. The tumour was composed of two parts, one flat and the size of half a dollar, with a bronzy colour; the second part looked like an ordinary cyst of the ovary.

Microscopically: On microscopic examination a manifold system of small lymph fissures could be seen, whose endothelium was undergoing marked proliferation and in places escaping from the lumen of the lymphatics and spreading into the surrounding tissue. The second part of the tumour shewed a structure of wide lymph spaces, in which the endothelial coverings were almost normal, except in certain places where these cells were undergoing rapid multiplication.

The condition was uni-lateral.

1904

FEDERLIN. Endothelioma Intravasculare.

Age, 52 years.

Macroscopically: Double ovarian tumours. The right tumour was the larger of the two, measuring

14 cm. long and 7 cm. wide; that of the left side measuring 11 x 7 cm.

The right-sided tumour was fairly regular in outline and cystic in consistency. While the left one had two marked protuberances, its surface being very irregular in outline. On section both tumours shewed marked cystic degeneration.

Microscopically: It was seen that there were many fissures present in the surrounding connective tissue, shewing repeated groups of neoplastic cells, such as were found in both ovaries.

There was one group of cells combined with red blood corpuscles, surrounded with endothelial cells, lying as in a capillary gland.

The condition was bi-lateral.

GRAEFE. Case I. Endothelioma Lymphaticum.
Age, 44 years

Macroscopically: A large cystic tumour, but from which side it arose is not stated.

Microscopically: In a thick somewhat swollen connective tissue stroma, here and there could be seen glandular tissue. The large irregularly formed nuclei of the cells were darkly coloured.

The cell cords were in rows of two and

three, many of them being spindle-shaped. In other portions of the tumour, oval, round, and pestle-shaped cell masses could be seen, enclosed in broad and narrow fesciculi of tissue, which seemed to indicate alveoli.

The condition was uni-lateral.

Case II. Endothelioma Perivasculare.
Age, 48 years

Macroscopically: A large bluish ovarian cyst was found affecting the left side and whose surface shewed the presence of many adhesions.

Microscopically: The tumour was seen to contain multitudes of blood vessels of various sizes, from quite large to minute capillaries, and in places these vessels were thickly heaped together. Here and there could be seen large blood spaces with irregular outlines. While the endothelium of the blood vessels sometimes remained intact, it was found mostly in the lacunae or gaps, which latter were in many cases surrounded by epitheloid cells. The transformation of endothelium into epitheloid cells could be traced, the small narrow nuclei gradually becoming larger and rounder, until they took on the more circular form of the tumour cells.

The condition was uni-lateral.

HEINRICIUS. Endothelioma Lymphaticum.

Age, 32 years

Macroscopically: A tumour the size of a child's head, but from which ovary it arose is not stated. The tumour had a smooth surface and there were no traces of adhesions. On section the capsule was seen to be 2-3 mm. thick.

Microscopically: The capsule was seen to consist of connective tissue, poor in cells and in some parts fibrous. In one part of the tumour the neoplastic cells had taken a cylindrical form with a cavity in the middle filled with liquid lymph. Marked proliferation of the endothelial cells lining the lymph vessels and spaces could be seen, to such an extent as to almost block the lumen.

The condition was uni-lateral.

KROMPECHER. Endothelioma (Variety not stated)

Age, 46 years.

Macroscopically: A large right ovarian tumour undergoing cystic degeneration, and on section shewing a considerable quantity of necrotic tissue.

Microscopically: Epithelial sprouts, epithelial nests, papillary connective tissue, and numerous blood-vessels together with a granular growth

of cells in the form of thin tubes, whose walls were formed of one or two layers of cells, could be seen. At these points it was found that the connective tissue had undergone hyaline degeneration, and this degeneration was surrounded by single layers of endothelium, in form resembling a cylindroma.

The condition was uni-lateral.

PAPAIOANNAU. Case I. Endothelioma Perivasculare. Age, 42 years.

Macroscopically: Large right-sided ovarian tumour the size of an adult head and in shape very much like a kidney.

Microscopically: Under the microscope large and small groups of cells could be seen, also cells arranged in columns, which in round or irregular form were imbedded in the connective tissue stroma. These groups contained many blood vessels whose endothelium was surrounded by neoplastic cells.

In the stroma were also numerous blood vessels, whose intima was formed of intact endothelial cells. Under high power a gradual passing of these groups into the stroma could be seen.

The condition was uni-lateral.

Case II. Endothelioma. (Variety not stated)
Age, 46 years

Macroscopically: Left-sided ovarian tumour, the size of a man's fist, nearly spherical in shape with a diameter of 14 cm. Surface smooth, with a few ridges; consistence solid.

Microscopically: Under the microscope a thick layer of dense connective tissue can be seen forming a capsule to the tumour, and to this capsule is attached the stroma of connective tissue which contains many oval lumina surrounded by endothelial cells.

The condition was uni-lateral.

Case III. Endothelioma. (Variety not stated)
Age, 52 years

Macroscopically: Left-sided ovarian tumour, in shape very much like an enlarged kidney. The surface was very smooth, but shewed evidences of recent adhesions. In some parts the consistence of the tumour was hard and in others elastic. On Section it was seen to consist of solid portions and cystic portions.

Though the microscopic findings of this case are not given, taking into consideration the

full and careful pathological description of his previous two cases, I have little hesitation in including this case among the series of endothelioma.

The condition was uni-lateral.

POLANO. Case I. Endothelioma Lymphaticum.

Age, 42 years

Macroscopically: Double ovarian tumours. The right being the larger of the two and equal in size to a child's head, while that of the left side was about the size of a fist. The tumours are both reddish brown in colour, but on section the capsule of the left is very much thinner than that of the right.

Microscopically: Microscopic examination of the left tumour shews the neoplastic cells imbedded in a stroma of connective tissue containing numerous cavities, which are separated from the stroma by a wall of tumour cells. The right tumour also shews numerous cavities filled with leucocytes, their walls being formed of single layers of cells, resembling normal endothelium. The contents of these cavities is lymph, so that it is certain that it is from the lymphatic vessels that the tumour arises. At certain parts neoplastic cells of many layers take the place of the endothelial envelope.

The condition was bi-lateral.

Case II. Endothelioma Perivasculare.

Age, 32 years.

Macroscopically: Right-sided ovarian tumour the size of a man's fist, and in shape very much that of an ordinary ovary greatly enlarged. The surface shewed the presence of numerous protuberances and was shaggy in places owing to adhesions. The tumour on section was of a uniform reddish brown colour.

Microscopically: On microscopic examination it was found that wherever there was a blood vessel its periphery was provided with a mantle of neoplastic cells. In the middle of the tumour where the greatest degeneration exists, there is no real tumour growth found, it being replaced by necrotic tissue. Even here the blood vessels shew a distinct cell mantle.

The condition was uni-lateral.

Case III. Endothelioma. (Variety not stated)

Age, 50 years.

Macroscopically: Double ovarian tumours, the right being the larger of the two and about the size of a man's fist; the left about the size of a hen's egg. Both tumours were hard in consistence

and shewed many flat protuberances.

Microscopically: Between the nodules were cords of solid connective tissue, otherwise no particulars are given.

The condition was bi-lateral.

Case IV. Endothelioma. (Variety not stated)
Age, 28 years

Macroscopically: Double ovarian tumours; the right larger than the left, being about the size of a man's fist, while that of the left was about the size of a child's fist. Both tumours were hard in consistence and shewed on the surface many knotty protuberances - those on the right tumour being larger than those on the left.

Microscopically: In the centre of the tumours could be seen numerous neoplastic cells of the highest grade of tissue ripeness. The malignant character of the new growth is here most plainly shewn.

The condition was bi-lateral.

Case V. Endothelioma. (Variety not stated)
Age, 56 years.

Macroscopically: Ovarian tumour the size

of a child's fist, but from which side it arose is not stated. The surface was quite smooth and clear white in colour.

Microscopically: The stroma was greatly oedematous, and hyaline degeneration was seen in places.

The condition was uni-lateral.

Although in the last three of this Author's series of cases no definite particulars of the pathological findings are given, I think one is justified in accepting his diagnosis of endothelioma when one takes into consideration the careful way he has gone into the pathology of the first two of the cases he has recorded.

1905

BARBOUR. Endothelioma Lymphaticum.

Age, 42 years.

Macroscopically: Double ovarian tumours of large size. Their actual dimensions are not given, but the right was somewhat the larger of the two. Both tumours were hard in consistence, having a nodular surface, and shewed the presence of some recent adhesions.

Microscopically: Under the microscope, near the surface of the tumour the neoplastic cells can be seen invading the stroma, and the lymphatics are seen to be dilated. In some of these the endothelial lining is unaltered, while in others it is taking on a columnar form, but these are evidently modified endothelial cells.

In some places the altered epithelium lies as a tubule in the lymphatic space, and it is somewhat difficult to say whether it has arisen from the endothelium at that point, or been carried along by the lymph stream from another point. In places it would almost appear as though the condition were an adenoma but for the fact that the spaces are undoubtedly lymph spaces. In some parts the formation of new lymphatics can be seen; and here the endothelium is undergoing active proliferation, the cells shewing mitosis.

The condition was bi-lateral.

Metastasis had occurred affecting the peritoneum and bowel.

BELLATI. Endothelioma. (Variety not stated)
Age, 35 years

Macroscopically: A large right-sided ovarian tumour, the dimensions of which are not

stated. The shape of the tumour was ovoid.

No microscopic findings are given and hence one is inclined to regard this case with suspicion.

The condition was uni-lateral.

GLOCKNER. Endothelioma. (Variety not stated)
Age, 48 years

Macroscopically: Double ovarian tumours. That of the right being the larger of the two, its dimensions reaching that of a man's head, while the one of the left was in size equal to a child's head.

Both tumours are irregular in outline - the right being somewhat oval in shape - and shew on their surface numerous protuberances and knots.

Microscopically: Beyond the fact that the microscopic examination shewed the structure of both tumours to be the same and that the condition was undoubtedly malignant, no further particulars are given.

The condition was bi-lateral.

1906.

SCHMAUS. Endothelioma (Variety not stated)
Age, 49 years

Macroscopically: Ovarian tumour removed. P.M.

No further particulars given.

Microscopically: On examination of metastatic nodules which had occurred on the peritoneum, omentum, &c., these shewed the characteristics of endothelial cancer.

1907

BERNSTEIN. Endothelioma Lymphaticum.

Age, 17 years.

Macroscopically: Large right-sided ovarian tumour measuring 17.5 x 12.5 x 14 cm. and weighing 3½ lbs. The surface was somewhat irregular and shewed the presence of adhesions.

Microscopically: On microscopic examination it was seen that the lymph spaces were dilated and filled with cells which seemed to have no tendency to extend beyond the lymph spaces.

The condition was uni-lateral.

BARRETT. Endothelioma Perivasculare.

Age, 37 years

Macroscopically: Right-sided ovarian tumour of an irregular ovoid shape, measuring 15 x 10 x 8.5 cm. and weighing 750 gms. At its smaller

end the tumour presents a nodular appearance, with evidences of adhesions; the remainder of the new growth shews a dull, smooth or slightly roughened surface. In colour it varies from a waxy yellow to dull dirty grey. On section the tumour shews two distinct portions - the larger portion undergoing colloid degeneration, and the smaller being practically solid. A distinct trabeculum of fibrous tissue separates the two portions. The solid part has a distinct capsule, friable in places, which is continuous with the capsule over the degenerated portions. The cut surface is greyish in appearance.

Microscopically: The tumour was seen to consist of a connective tissue stroma containing a rich supply of blood vessels. There is marked proliferation of the cells surrounding the blood vessels - to such an extent as to practically obliterate them in places. In other places neoplastic cells can be seen in apparent alveoli, in thick cords and single chains. The perivascular arrangement seen, points to the classification. Many of the cells shew well marked karyokinesis.

The condition was uni-lateral.

This collection of Cases is probably very far short of being a complete series of all the cases of Endothelioma of the Ovary recorded, and even amongst this series there are several cases which must be considered as doubtful.

However there are several other cases in which the diagnosis of Endothelioma has been made which I have not included, being unable to find any particulars of them beyond their mere mention, viz:

In 1884 Jones reported several cases.

In 1888 Seeger reporting on 15 solid ovarian tumours describes 3 cases of what he calls "carcinoma sarcomatosum".

Limnell in giving statistics of 50 ovarian tumours mentions 3 cases of endothelioma.

In 1904 Bonney mentions a case.

In 1905 Kadygrobow records a case.

In 1908 Briggs and Walker in their statistics of 488 Ovarian Tumours speak of one as being a perithelioma.

These extra cases may therefore tend to some extent to counter balance the doubtful cases in this series of 87.

I am greatly indebted to the very valuable and comprehensive papers on this subject by Barbour and Barrett, from which I have derived considerable assistance in the compilation of this Thesis.

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